Pacific
Salmon
Commission

1999/2000

Fifteenth Annual
Report

Pacific Salmon Commission

Established by Treaty between Canada and the United States March 18, 1985
for the
conservation, management and optimum production of Pacific salmon

Fifteenth Annual Report 1999/2000

Vancouver, B.C.
Canada

January, 2001

PACIFIC SALMON COMMISSION

ESTABLISHED BY TREATY BETWEEN CANADA
AND THE UNITED STATES OF AMERICA
MARCH 18, 1985

101-04300/

600 - 1155 ROBSON STREET
VANCOUVER, B.C. V6E 1B5
TELEPHONE (604) 684-8081
FAX (604) 666-8[illegible]37

Our File:

Your File:

Letter of Transmittal

In compliance with Article II, Paragraph 14 of the Treaty between the Government of Canada and the Government of the United States of America concerning Pacific salmon, it is my pleasure as Chair of the Pacific Salmon Commission to present my compliments to the Parties and to transmit herewith the Fifteenth Annual Report of the Commission.

This report summarizes the activities of the Commission for the fiscal year April 1, 1999 to March 31, 2000.

On June 3, 1999 the Parties signed a comprehensive long-term agreement under the Pacific Salmon Treaty. The agreement established abundance-based fishery regimes for the major interception fisheries in the United States and Canada. The arrangements are all for ten years, except those for Fraser River sockeye and pink salmon, which are for 12 years. The agreement also established two bilaterally-managed regional funds, and included provisions to enhance bilateral cooperation, improve the scientific bases for salmon management and apply institutional changes to the Pacific Salmon Treaty. A summary of the agreement is presented in the report.

Reports on the results of the 1999 fishing season presented by the Parties and on meetings of the Commission and the Standing Committee on Finance and Administration are presented in summary. Executive summaries of documents prepared by Pacific Salmon Commission staff and the joint technical committees during the period covered by this report are also presented.

The Auditors' report on financial activities of the Commission during the fiscal year April 1, 1999 to March 31, 2000, as approved by the Commission, is also included in this report.

Yours truly,

Curt Smitch

C. Smitch
Chair

PACIFIC SALMON COMMISSION

OFFICERS for 1999/2000

Chair	Patrick S. Chamut (to November 30, 1999) Curt Smitch (from November 30, 1999)
Vice-Chair	W. Ron Allen (to November 30, 1999) Patrick S. Chamut (from November 30, 1999)

COMMISSIONERS

United States

Mr. Curt Smitch (Chair)
Mr. W. Ron Allen
Mr. James Pipkin
Mr. David Benton
Mr. Jev Shelton
Mr. Rollie Rousseau
Mr. Larry Rutter
Mr. Ted Strong (to January 12, 2000)
Mr. Donald Sampson (from January 12, 2000)

Canada

Mr. Patrick S. Chamut (Vice-Chair)
Mr. Hubert Haldane
Mr. Michael Hunter
Mr. Gerry Kristianson
Mr. Rich Chapple
Mr. Gibby Jacob
Mr. Paul Sprout
Mr. Bill Valentine

SECRETARIAT STAFF

Executive Secretary	Mr. Don Kowal
Administrative Officer	Mr. Ken Medlock
Chief Biologist	Dr. Jim C. Woodey

Contents

Letter of Transmittal iii

Introduction xi

I. Activities of the Commission 1

A. Executive Session Of The Pacific Salmon Commission 3
B. Post 1999 Fishing Season Meeting Of The Commission 5
C. Fifteenth Annual Meeting Of The Commission 6

II. Activities of the Standing Committee 9

A. Meetings Of The Standing Committee On Finance & Administration 11
B. Meetings Of The Standing Committee On Research & Statistics 12

III. Activities of the Panels 13

A. Fraser River Panel 15
B. Northern Panel 15
C. Southern Panel 15
D. Transboundary Panel 16

IV. Review of 1999 Fisheries and Treaty-Related Performance 17

A. Fraser River Sockeye Salmon 19
B. 1999 Post-Season Report For Canadian Treaty Limit Fisheries 22
C. Preliminary 1999 Post-Season Report For United States Salmon Fisheries of Relevance to the Pacific Salmon Treaty 41
D. 1999 Update Reports For Salmonid Enhancement Programs in the United States and Canada 68

(1) 1999 Report on the Salmonid Enhancement Program in British Columbia 69
(2) 1999 Report on the Salmonid Enhancement Activities of the United States 69

V. Reports of the Joint Technical Committees 71

A. Chinook 73
B. Chum 73
C. Coho 73
D. Northern Boundary 73
E. Transboundary 73
F. Data Sharing 78
G. Selective Fishery Evaluation Committee 81

VI. Publications of the Pacific Salmon Commission 85

VII. Report of the Auditors 95

VIII. Appendices 107

A. Correspondence to Parties from Chief Negotiators Regarding Proposed Agreement Related to the Pacific Salmon Treaty - June 23, 1999 109
B. Exchange of Diplomatic Notes Regarding Comprehensive Agreement Between the Parties Related to the Pacific Salmon Treaty Signed on June 30, 1999 111
C. Summary of Pacific Salmon Agreement Reached by United States and Canadian Negotiations 115
D. Annex I and Annex IV of the Pacific Salmon Treaty Revised 1999 and Attachments Regarding Management of Northern Coho; Restoration and Enhancement Funds; Renewed Cooperation on Scientific and Institutional Matters; and Habitat and Restoration 120
E. Appointment of Officers for 1999/2000 170
F. Approved Budget FY 1999/2000 171
G. Pacific Salmon Commission Secretariat Staff as of March 31, 2000 172
H. Membership Lists for Standing Committees, Panels, Joint Technical Committees, and Other Appointments as of March 31, 2000 173

INTRODUCTION

Interception of Pacific salmon bound for rivers of one country in fisheries of the other has been the subject of discussion between the Governments of Canada and the United States of America since the early part of this century. Intercepting fisheries were identified through research conducted by the two countries on species and stocks originating from Alaska, British Columbia, Washington and Oregon. The results of this research identified that Alaskan fishers were catching salmon bound for British Columbia, Oregon and Washington. Canadian fishers off the West Coast of Vancouver Island were capturing salmon bound for rivers of Washington and Oregon. Fishers in northern British Columbia were intercepting salmon returning to Alaska, Washington and Oregon, and United States fishers were catching Fraser River salmon as they travelled through the Strait of Juan de Fuca and the San Juan Islands towards the Fraser River.

Management of stocks subject to interception became a matter of common concern to both Canada and the United States. A mechanism to enable the countries to reap the benefits of their respective management and enhancement efforts was required. That mechanism is now provided through the Pacific Salmon Treaty, which entered into force upon the exchange of instruments of ratification by the President of the United States of America and the Prime Minister of Canada on March 18, 1985.

The Pacific Salmon Commission, guided by principles and provisions of the Treaty, establishes general fishery management regimes for international conservation and harvest sharing of intermingling salmon stocks. Each country retains jurisdictional management authority but must manage its fisheries in a manner consistent with the provisions of the Treaty. Implementation of the principles of the Treaty should enable the United States and Canada, through better conservation and enhancement, to prevent overfishing, increase production of salmon, and ensure that each country receives benefits equivalent to its own production. The Commission also serves as a forum for consultation between the Parties on their salmonid enhancement operations and research programs.

The organizational structure of the Commission is currently focused on four geographically oriented panels. The Transboundary Panel was created in June, 1999, under terms of new Treaty arrangements signed by the Parties. The Transboundary Panel's stocks of concern originate from the Alsek, Stikine and Taku River systems. The Northern Panel's stocks of concern are those which originate in rivers situated between Cape Suckling in Alaska and Cape Caution in British Columbia. The Southern Panel's stocks of concern are those which originate in rivers located south of Cape Caution, other than Fraser River sockeye and pink salmon. The Fraser River Panel has special regulatory responsibilities for stocks of sockeye and pink salmon originating from the Fraser River.

The functions of panels are to review annual post-season reports, annual pre-season fishing plans, and ongoing and planned salmonid enhancement programs of each country and to provide recommendations to the Commission for development of annual fishery regimes in accordance with the objectives of the Treaty. These plans, once adopted by the Commission and the governments, are implemented by the management agencies in each country.

The Fraser River Panel, in addition, has been accorded special responsibility for in-season regulation of Fraser River sockeye and pink fisheries of Canada and the United States in southern British Columbia and northern Puget Sound, in an area designated as Fraser River Panel Area Waters. Scientific and technical work is conducted for the Panel by the Fishery Management Division of the Commission's Secretariat staff.

Negotiations designed to lead to agreed fishery regimes were conducted at the government-to-government level commencing in the spring of 1998. A comprehensive agreement was reached by the Parties on June30, 1999.

As a result of the agreement, long-term fishing arrangements are in place for ten years, except for Fraser River sockeye and pink salmon which is a 12 year arrangement.

With fishery arrangements in place, the meeting agendas for the Commission have concentrated on implementation of the elements of the new arrangements that will improve fisheries management and aid the countries efforts to recover weakened stocks. These provisions include establishment of two bilaterally-managed restoration and enhancement funds, provisions to enhance bilateral cooperation, improving the scientific basis for salmon management and applying institutional changes to the Pacific Salmon Commission.

Appendixes A-D include the respective Memorandum of Understanding, Letters of Transmittal, summary of the new long term arrangements and the revised text to Annex I and IV as well as the new attachments to the Pacific Salmon Treaty.

The Commission meets at least once annually and conducts its business between meetings through its permanent Secretariat located in Vancouver, British Columbia. In the period April 1, 1999 to March 31, 2000, the Commission met on three occasions:

1. Commission Executive Session
   November 29- December 3, 1999 - Ketchikan, Alaska

2. Post-Season Meeting of the Commission and Panels
   January 10-14, 2000 – Portland, Oregon

3. Fifteenth Annual Meeting of the Commission
   February 7-11, 2000 – Vancouver, B.C.

This, the Fifteenth Annual Report of the Pacific Salmon Commission, provides a synopsis of the activities of the Commission and its subsidiary bodies during its fifteenth fiscal year of operation, April 1, 1999 to March 31, 2000.

Activities of the Commission

PART I
ACTIVITIES OF THE COMMISSION

A. EXECUTIVE SESSION OF THE PACIFIC SALMON COMMISSION
November 29 - December 3, 1999 – Ketchikan, Alaska

The Commission met in executive session for the first time following the successful signing of new Treaty arrangements in June. The Commission adopted a revised agenda and exchanged partial lists of officers for Panels and Technical Committees. The United States assumed the role of Chair and Ron Allen acted as the United States interim Chair. The Commissioners agreed that the draft meeting schedule would be reviewed at the January session.

The United States provided a copy of their preliminary 1999 Post-Season report. Canada provided a verbal report and would distribute the written document prior to the January 2000 meeting.

The meeting then commenced a thorough review of Annex IV commitments and provisions. It was reported that the President of the United States had signed the FY2000 appropriations which provided $20,000,000 for the Endowment Fund for the Year 2000 ($10,000,000 for each fund). The contingencies to the availability of the funds were identified as the need for the assurance by National Marine Fisheries Service of a biological opinion that the new agreement does not violate the Endangered Species Act (ESA); and the requirement that stipulations in two Federal lawsuits be filed prior to December 31.

The United States then reviewed the U.S. Endangered Species Act process and explained that since a number of salmon species are listed under the ESA, any action taken by the Federal Government that may affect these species must be reviewed. The review is conducted to determine whether the action, in this case approval of the new PSC agreement, poses jeopardy to the long term existence of the salmon species listed. The National Marine Fisheries Service developed a subset of jeopardy standards in order to review problematic Puget Sound stocks which are greatly affected by Canadian fisheries. It was determined that the new PSC arrangements meet the jeopardy standards, although vigilance must be shown with the conduct of fisheries in southern waters.

The Coho Technical Committee reported to the Commissioners that the new abundance based management option would not be ready for the 2000 fishing season. The bilateral technical committee would be developing exploitation targets, profiles of stocks, a bilateral planning model and implementing a planning process that would be applied for the Year 2000. The Commissioners stressed the importance of forming a coho working group and of keeping the coho commitments in the Treaty on track.

The Chinook Technical Committee reported that the new chinook chapter had been reviewed and all the tasks have been identified, individual tasks assigned, and a time frame for completion of tasks established. The Committee will report in January on the tasks identified and would be confirming priorities with the Commissioners.

Commissioners were advised that proposals for mass marking and selective fishery initiatives have been received from Washington and Oregon. It was indicated that proposals received last year were not evaluated by the Commission and that the process this year will have to be completed. The Executive Secretary was requested to review the minutes and to circulate to Commissioners the Commission policy on Mass Marking/Selective Fishing.

During a discussion regarding the Endowment Fund, the United States indicated that the funds are given to the Pacific Salmon Commission; the PSC hires an investment manager; and disbursement of the funds is determined by the fund committees. Two key documents are being prepared. The first is a trust agreement between the Parties which was prepared by State Department and has been circulated. The second is a contract between the PSC and the investment manager which will be completed and discussed in January.

In a discussion regarding Institutional Changes the Commissioners agreed that the newly created Transboundary Panel would be comprised, for efficiency purposes, of six members versus the usual 12 members. It was agreed that members, either interim or full members, would be named by January 2000.

The Commission then reviewed a Canadian proposal that the new Committee on Scientific Cooperation consist of eight members, four from each Party, and have a mandate to assist in setting the scientific agenda of the PSC. As well, it was proposed that the committee monitor progress, advise on distinctions between technical and policy issues, provide peer evaluation and provide advice on habitat. It was also suggested the Committee be used to provide a link for the PSC with the North Pacific Anadromous Fish Commission and, thus, identify bridges between the two groups. The Commissioners agreed that each Party would fund their own members and that rules of procedure for committees already existed within the PSC by-laws. The Commission agreed to set this issue aside pending further review.

The Commission agreed that Canada would prepare a paper as a follow-up to a recommendation made in the Strangway and Ruckelshaus report. The report had recommended that a review of the organization of the Commission and how it functions be undertaken with a view to a more effective and efficient operation. The Canadian report will be presented in January 2000.

The Commission agreed that Mr. Don McRae be engaged to prepare a paper on Dispute Resolution for presentation in February 2000.

The Commission agreed on the formation of an ad hoc Committee by January 20. The Committee would be tasked with presenting a report in February on the form and content of habitat related reporting as expressed in the new PSC arrangements.

The Commission agreed on the contents of a document entitled "Tasks Required to Implement the 1999 Pacific Salmon Agreement". The Executive Secretary was requested to provide the list to Panel Chairs, Vice-Chairs and Technical Committee Co-Chairs. In addition, instructions were to be provided indicating that the list was in addition to ongoing assignments, and that assignments were to be reviewed, a timetable for completion prepared, and that any concerns regarding completion of the tasks should be identified. The Panels and Committees would report to the Commission in January 2000.

The Commission reached consensus that the Executive Secretary should proceed with a PSC Treaty publication which would include the Treaty, Revised Annex I and IV, Memorandum of Understanding (1985) and Exchange of Notes - August 13, 1985 and June 30, 1999. The Commission agreed that the F&A Committee would meet in Portland, Oregon on January 13, 2000.

B. MEETING OF THE COMMISSION AND PANELS
January 10-14, 2000 - Portland, Oregon

The Commission met three times in executive session during this meeting. Mr. Don Sampson was introduced by the U.S. Chair of the Commission, Curt Smitch, as the U.S. Commissioner replacing Mr. Ted Strong. The Commission adopted the agenda, approved minutes from the February 9-11, 1999 session, and gave approval of the draft meeting schedule for 2000/2001.

The first session proceeded with follow-up reports from the Executive Session in Ketchikan, Alaska. The United States, during the update on the Endowment Fund process, reported that the National Marine Fisheries Service had issued a biological opinion confirming fish regimes under the Treaty were in compliance. As well, stipulation orders had been filed in Federal Court satisfying contingencies in the U.S. Appropriations Legislation. As a result funds were available and the first installment of $20,000,000 had been received by the Commission. The two countries signed a Trust Agreement and proposed PSC by-law amendments are being redrafted. The Commission agreed to hear presentations from Investment Advisors at the next meeting. In addition, Rich Chapple, Executive Director of the Pacific Salmon Foundation, made a presentation regarding potential project criteria for the Fund.

Canada circulated a discussion paper regarding the PSC structure review with the key objectives of the review being to ensure the form and function of the Commission reflect the new agreement; to improve effectiveness of the Commission, and finally, to control and reduce costs. The Executive Secretary was requested to review meeting costs under difference scenarios for the February 2000 meeting.

The Commission discussed the criteria for selection of Committee members and the type of expertise required for the Committee on Improved Cooperation on Science. The United States agreed to prepare a discussion paper.

The Commission agreed on the formation of a bilateral habitat working group to develop an issue paper by the February 2000 meeting. The paper would include recommending the scope of a habitat report, use, technical analyses required and by whom, interface with the science cooperation committee, who would write report and how Commission would execute report recommendations.

The Commission received a draft of a document entitled "Canada/U.S. South Managers Proposals for Year 2000 Fishery Planning". The document proposed how to merge the Pacific Fishery Management Committee process with Canadian management/planning process. It was agreed the proposal required further review by the bilateral Southern Panel.

The Commission discussed the process in place for the Commission to review proposals brought forward by agencies wanting to conduct selective fishery programs. Currently, both Washington and Oregon have made proposals. The policy in place would have the Commission respond to the agencies by February.

The Commission heard presentations from the Chinook Technical Committee and the Selective Fishery Evaluation Committee and from the Coho Technical Committee.

The session ended with Commissioners expressing appreciation and thanks to Dennis Austin, who is retiring, for his many years of dedicated service and thoughtful contribution to the PSC process, especially with the Fraser Panel.

C. FIFTEENTH ANNUAL MEETING OF THE COMMISSION
February 7-11, 2000 - Vancouver, B.C.

The Commission met in Executive Session on five occasions. The initial session commenced with Canada presenting a discussion paper on Dispute Resolution. A summarized report was given and following some discussion, the Commissioners agreed that Canada would take the paper to the next step and develop a Dispute Resolution proposal with the aid of appointed U.S. members. The proposals would be presented in November, 2000.

At the second session the Commission agreed that a Endowment Fund Committee would be struck with three members from each Party to select an Investment Consultant. The consultant would lead development of a governance framework, provide advice on asset balance and risk, and assist in hiring of an investment manager. The Commission also approved amendments to PSC by-laws that provide for establishment and administration of the Endowment Fund.

The Southern Panel reported to the Commission at the third session. The Panel has been working with the coho working group and focusing on coho abundance based management for the long term. It has also engaged in discussions for 2000. The meeting schedule presented by the Panel was endorsed by the Commission. The Coho Technical Committee then gave an update on the abundance based management approach, the main workload at this time being completion of fishery profiles.

The Data Sharing Committee presented a report to the Commission which was adopted. As a result of the Committee's recommendations, the Commission will be sending a letter to agencies encouraging free exchange of data on catch and effort. As well, the Catch Data Exchange Work Group and the Mark-Recovery Statistics Work Group will be disbanded.

The United States presented to the Commission a discussion paper on the Committee for Scientific Cooperation. A discussion took place regarding membership to the Committee and on the Committee's role in dealing with habitat issues.

The third session of the Commission commenced with a discussion regarding selective fisheries. The Parties exchanged statement papers regarding the issue. The Commission concluded that a better understanding of the full implication of selective fishery programs was required, including agreement on technical solutions that impact on the coded-wire-tag program for chinook. The Commission also acknowledged the importance of being able to respond to sponsoring agencies in a timely manner. The Commission agreed on a "statement of the Commission" regarding mass marking and selective fishing and agreed the statement would be sent from them to participating agencies.

The Habitat Form and Function Committee presented the Commission with a discussion paper. The Committee agreed to make a presentation in April that would focus on developing the scope of the committee and that would develop a template for looking at some index stocks. In addition, the Committee would make recommendations to the Commission on how to react to habitat issues that would be different from mandates of other agencies.

The Commission received a report from the Chinook Technical Committee whereby they indicated work had been completed on exploitation rates and that work regarding calibration would be completed by March.

At the final session, the Commission accepted the report of the Finance and Administration Committee which focussed primarily on a review of the Commission's current financial status, budget proposals for FY2000/2001, a budget forecast for 2001/2002, and the future meeting schedule of the Commission.

The Commission followed up on earlier discussions regarding the Review of PSC Structure. The Commission agreed that changes will occur over the next two years and this item will remain as a standing agenda item. Immediate action related to reshaping the January Commission and Panel Meeting and continued refinement of new administrative structures.

The final agenda item for the Commission related to the Committee on Scientific Cooperation. Following the discussion, Canada agreed to prepare a paper building on the U.S. discussion paper that had been presented and reflecting the new approach discussed.

Due to the workload and number of outstanding items, the Commission agreed to hold an Executive Session in Portland, Oregon, on April 26-27, 2000.

Activities of the Standing Committees

PART II
ACTIVITIES OF THE STANDING COMMITTEES

A. MEETINGS OF THE STANDING COMMITTEE ON FINANCE AND ADMINISTRATION

1. Committee Activities

The Committee met on January 14, 2000 in Portland, Oregon, and February 7, 2000 in Vancouver, B.C. to consider a range of financial and administrative issues. The Committee's deliberations focussed primarily on a review of the Commission's current financial status, budget proposals for FY 2000/2001 and a budget forecast for FY 2001/2002.

The Committee, on January 14, 2000, reviewed staff projections of expenditures for the current fiscal year. The Committee requested staff to maximize carry-over available for 2000/2001, and to revise projections accordingly. This review resulted in an increased carry forward of $76,000, providing a total of $249,221 available for the 2000/2001 fiscal year. The increase is the result of deferral of capital items. The committee **recommends** that these funds be carried over for application against program costs in FY 2000/2001.

At the January 14, 2000 session staff presented a budget proposal for FY 2000/2001 which included new project proposals in response to Party requirements for more accurate information but which also generated a total deficit of $775,186. The Committee recognized that reliance on the test fishery cannot continue due to changes in the natural environment, conservation concerns and by-catch issues. As a result they directed the staff to stabilize the base budget before introducing new program expenditures.

Staff was requested to prepare a revised FY 2000/2001 budget proposal which would reduce the projected deficit by increasing the amount of carry-over, by reviewing current programs to identify opportunities for savings and by eliminating proposed new programs.

At the February 7, 2000 meeting, staff presented a series of options to the F&A Committee for FY 2000/2001. The Committee **recommended** acceptance of the option that increased the carry-over from FY 1999/2000, removed the new programs, and reduced administrative expenses of the Commission.

The Committee thus **recommended** adoption of the Commission's budget for 2000/2001, based on an expenditure level of $2,367,255 subject to the availability of funding to permit an increase of $256,000 (Cdn.) in contributions by the Parties.

The increase in contributions would be $206,000, ongoing by each Party. In addition, $50,000 would be provided as a one-time contribution by each Party, to offset the pay equity compensation liability.

The Committee also reviewed the revised budget forecast for FY 2001/2002. The Committee notes the forecasted funding shortfall of approximately $501,533 for that fiscal year. Staff will provide an interim report at the end of June 2000 which would include final financial results from FY 1999/2000, and could incorporate an updated projection of test fishing results for 2000. If it appears at that time that action needs to be taken for FY 2001/2002, the Committee will so inform the Commission.

The Committee also reviewed the Commission's future meeting schedule previously agreed to by the Commission in January 2000 and confirmed the following future meeting dates and locations:

a) December 2000 – Executive Session – Vancouver, PSC offices
b) January 2001 – Commission and Panels – Vancouver, Four Seasons Hotel
c) February 2001 – Annual Meeting – Portland, Embassy Suites
d) December 2001 – Executive Session – Juneau, Alaska
* e) January 2002 – Commission and Panels – Portland, Oregon
f) February 2002 – Annual Meeting – Vancouver, Four Seasons Hotel

This completes the report of the Standing Committee on Finance and Administration. The Committee is pleased to **recommend** adoption of this report by the Commission.

*Subject to decision regarding institutional changes.

The Commission, at its February 11, 2000 executive session, adopted the recommendations of the Standing Committee on Finance and Administration.

2. Secretariat Staffing Activities

A list of Secretariat staff employees as of March 31, 2000 is presented in Appendix G.

An updated membership list for panels, standing committees, joint technical committees and ad hoc working groups as of March 31, 2000 is presented in Appendix H.

B. MEETINGS OF THE STANDING COMMITTEE ON RESEARCH AND STATISTICS

The Standing Committee on Research and Statistics has been eliminated and replaced with the Committee on Scientific Cooperation. The form and function of the Committee on Scientific Cooperation is still under consideration by the Commission.

Activities of the Panels

PART III
ACTIVITIES OF THE PANELS

A. FRASER RIVER PANEL

Canada and the United States reached a comprehensive agreement on Pacific salmon on June 3, 1999, which included a renewed Annex IV of the Pacific Salmon Treaty. Chapter 4 of the Annex provided catch sharing arrangements for Fraser River sockeye and pink salmon for the years 1999-2010. The Panel was therefore able to carry out its in-season fishery management responsibilities. Commission staff conducted its regular in-season assessment programs and reported results to the Panel.

The Panel met in bilateral session during the January and February 2000 meetings of the Commission to review the results of the 1999 fishing season and receive reports from Canada on spawning escapements. Issues of particular concern to the Panel were environmental conditions and en route mortality of sockeye salmon in the Fraser River in 1999, and proposed changes to Panel test fishing programs to ensure data needs are met in the future.

B. NORTHERN PANEL

The Northern Panel met during the January 2000 session of the PSC and again at the February Annual Meeting. The Panel reviewed the conduct of the 1999 fisheries.

C. SOUTHERN PANEL

The Southern Panel had been inactive for a number of years leading up to the signing of the new PST agreement in June of 1999. With the signing of the agreement, the Panel was charged with the responsibility of developing an abundance-based management regime for coho. During the 1999/2000 fiscal year, Panel discussions focussed primarily on this task. In order to facilitate this initiative a bilateral Coho Working Group was established comprised of the co-Chairs of the Coho Technical Committee, the co-Chairs of the Southern Panel, and three additional members from the U.S. and four additional members from Canada. The Working Group is to be responsible for leading development of the coho management plan.

Activities of the Southern Panel and Coho Working Group over the past year are summarized as follows:

1) Post-Season Fishery and Stock Status Reports

Post-season fishery reports with preliminary reporting of catches and spawning escapements, where available, were developed by the parties and exchanged at the December Executive Session.

2) Coho Management Planning

The Southern Panel convened a bilateral session at the January meeting of the Pacific Salmon Commission, in Portland during the week of January 10.

Southern Panel members reviewed the 1999 post-season fishery reports and exchanged views on the conduct of the fisheries, as well as the general and preliminary status of coho and chinook stocks of concern to the Panel.

The Panel met bilaterally at three different sessions during the week to review and understand the strategy for implementing the Coho Annex of the 1999 Treaty. Co-Chairs of the Joint Coho Technical Committee presented their views on technical products needed for successful implementation and the status of projects. The Panel discussed the three major areas of focus for the Coho Technical Committee:

1. Preparation of profile descriptions for coho stock management units, with criteria for determining status;
2. Preparation of profiles descriptions for Boundary Area fisheries; and,
3. Development of a prototype regional fishery planning model.

Both the Southern Panel and the Coho Work Group met in Vancouver, B.C., during the week of February 7 and continued discussions of the necessary elements for implementing the coho management plan. A presentation was made by the Coho Technical Committee on the use of the "CoRam" fishery simulation model.

Southern Panel and Coho Working Group discussions also concluded that implementation of a new coho management plan could not be accomplished during the 2000 season, but that significant progress could be made toward implementation in 2001 by prioritizing completion of technical work tasks during the summer of 2000 (including conducting a technical workshop), and by timely exchange of information during the domestic management planning processes of the nations. To assist on the latter task a "Manager to Manager" session was held in Tulalip in March 1999 between key Canadian and U.S. managers.

D. TRANSBOUNDARY PANEL

The Canadian appointments to the panel were made in the summer of 1999. The initial meeting of the Panel took place in Portland at the January 2000 session of the Pacific Salmon Commission. The Panel met again in Vancouver at the Pacific Salmon Commission 15th Annual Meeting. Formal appointments for United States members to the Panel have been delayed until amendments to the U.S. implementing law can be ratified by Congress. On an interim basis the United States had members of the Northern Panel, with experience on transboundary river issues, serve on an ad-hoc basis. The initial meetings primarily focused on review of stock status, fisheries and on the Treaty processes.

Review of 1999 Fisheries and Treaty-Related Performance

PART IV
REVIEW OF 1999 FISHERIES AND TREATY-RELATED PERFORMANCE

The following review has been drawn from a number of reports prepared by Commission staff, joint technical committees, and domestic agencies for presentation to the Commission. Source documents are referenced for each part of this review. All figures are preliminary and will be updated in future reports as more complete tabulations become available.

A. FRASER RIVER SOCKEYE SALMON

Canada and the United States agreed on a renewed Annex IV of the Pacific Salmon Treaty on June 3, 1999. Chapter 4 of the Agreement provided catch sharing arrangements for Fraser River sockeye and pink salmon for the years 1999-2010. New provisions were added that formalize agreements that have guided the Panel in recent years. These include the definition of total allowable catch (TAC) for international sharing, the calculation of adjusted shares for harvest overages or underages in previous years, and the provision that all fisheries under the Panel's jurisdiction are "closed unless opened for fishing by in-season order of the Panel".

The Fraser River Panel managed commercial net fisheries and the Canadian "inside" troll fishery in the Panel Area in 1999 under the terms of the Agreement. The United States catch in Panel Areas (Washington) was not to exceed 22.4% of the Total Allowable Catch (TAC) of Fraser River sockeye salmon and 25.7% of the TAC of Fraser River pink salmon. Panel Area fisheries in Canada and Canadian fisheries outside the Panel Area were to be managed in a manner that anticipated and accommodated catches in United States fisheries.

Canada provided the Panel with run-size forecasts and spawning escapement targets for Fraser River sockeye and pink salmon on July 6. The forecast returns were 8,248,000 sockeye and 8,148,000 pink salmon, with spawning escapement targets of 2,687,000 adult sockeye and 6,000,000 pink salmon at the forecast abundances. The forecasts by timing group were 318,000 Early Stuart, 477,000 Early Summer, 5,328,000 Summer and 2,125,000 Late-run sockeye. Corresponding spawning escapement targets were 150,000, 260,000, 1,489,000 and 788,000 fish, respectively. Canada also forecast that 16% of Fraser sockeye would migrate through Johnstone Strait (i.e., diversion rate). The forecast of peak migration timing for Chilko sockeye in Area 20 was August 3. Canada also provided forecasts of diversion rate (41%) and Area 20 peak migration (August 28) for Fraser River pink salmon in August.

On July 15, Canada provided the Panel with gross escapement targets for adult sockeye. Targets were 146,000 Early Stuart, 374,000 Early Summer, 2,370,000 Summer and 798,000 Late-run sockeye, for a total of 3,688,000 fish. These numbers included management adjustments of 13,000 Early Stuart and 75,000 Early Summer sockeye, to compensate for historical differences between in-season and post-season estimates of gross escapement. The gross escapement target for pink salmon was 6,000,000 fish.

On July 16, the Panel adopted regulations for regulatory control of Panel Areas. The Panel also adopted a fishing schedule that was developed using the Fishery Simulation Model. Fisheries in 1999 were designed to focus on Chilko sockeye, the dominant Summer-run stock. Restrictions on fishing were expected early in the season to protect Early Summer sockeye and late in the season to protect Late-run sockeye. Forecasts of diversion rate through Johnstone Strait and peak migration dates that were provided by Fisheries and Oceans Canada (DFO) were accommodated in the fishing plan.

The Panel encountered three significant challenges to their management activities in 1999. First, abundances of Early Stuart, Summer and Late-run stocks were considerably below the respective forecasts, resulting in substantial reductions of planned fisheries. Second, abnormally high water flows in the Fraser River during the Early Stuart, Early Summer and early part of the Summer-run migrations caused difficult passage conditions in the Fraser Canyon and upstream of this point. These environmental conditions led to large en route and pre-spawning mortalities among Fraser sockeye stocks. Third, an unusual lack of delay of Late-run sockeye in the Strait of Georgia and their consequent early migration into the Fraser River made assessment of these stocks difficult. Subsequent large en route and pre-spawning mortalities of Late-run sockeye were likely related to the early upstream migration.

The estimated total return of Fraser River sockeye salmon in 1999 was 3,644,000 fish, less than half of Canada's pre-season forecast and the lowest on the cycle since 1955. The Fraser River pink salmon return of 3,593,000 was also less than half of the forecast and the lowest odd-year return since 1965.

Restrictions on fishing were severe in both countries, primarily due to the low abundance of sockeye salmon. In the United States, only early fisheries in Juan de Fuca Strait (Areas 4B, 5 and 6C) were conducted. The Fraser River Panel was unable to approve commercial fishery openings in any other Panel area in either Washington or Canadian waters.

Catches of Fraser River sockeye salmon in all fisheries totalled 564,000 fish, which at 15% of the total run was the lowest harvest rate on record. Canadian catches amounted to 423,000 sockeye, United States fishers harvested 42,000 fish, and test fishery catches totalled 99,000 sockeye. Canadian catches included 49,000 in commercial, 350,000 in First Nations', 17,000 in recreational, and 4,000 in charter fisheries. Virtually all of the Canadian commercial catch occurred in non-Panel areas (Johnstone Strait). An additional 3,000 Weaver Creek sockeye were caught in an "excess salmon to spawning requirements" (ESSR) fishery in the Harrison River. Within the United States catch, 20,000 fish were harvested in Washington waters and 22,000 in Alaska. Commercial fishery catches in both countries summed to 91,000 fish, which represents a record low commercial exploitation rate of 2%.

Catches of Fraser River pink salmon totalled 163,000 fish: 131,000 in Canadian, 17,000 in United States and 15,000 in Panel-approved test fisheries. Commercial catches in both countries summed to only 10,000 fish. Included in the Canadian total were 7,000 fish in commercial, 67,000 in First Nations' and 57,000 in recreational fisheries. Most First Nations' and recreational catches occurred in marine areas. Within the United States total, the majority of fish (13,000 fish) were taken in recreational fisheries.

The Stock Monitoring program provided in-season estimates of abundance, migration timing and diversion rate of Fraser River sockeye and pink salmon throughout the fishing season. Because of the severe restrictions on fisheries, commercial catch data were not available for these purposes. Instead, in-season assessments in 1999 relied largely on Mission hydroacoustic estimates of daily escapement and on data from various test fishery operations.

Peak migration timing was near normal for Early Stuart (July 2 in Area 20), Summer-run (August 3 in Area 20) and Late-run sockeye (August 16 in Area 20). The peak migration date for Early Summer stocks in Area 20 was July 26. The estimated proportion of Fraser sockeye that migrated via Johnstone Strait (diversion rate) was 50%. For Fraser River pink salmon, the peak migration date (September 7 in Area 20) was ten days later than forecast, while the diversion rate through Johnstone Strait was very high at 80%.

The Racial Identification program provided estimates of stock composition for catches in commercial, Aboriginal and test fisheries. Such estimates were then used to estimate run size and gross escapement of individual stock groups. In 1999, scale characteristics, parasite data and length data were all employed to estimate the proportions of sockeye stock groups in mixed-stock fisheries. The primary difficulty encountered was in discriminating among Seymour/Scotch (Early Summer), Chilko/Quesnel (Summer) and Adams/Lower Shuswap (Late) stocks, due to a high degree of overlap in their scale characteristics. A post-season re-analysis using standards developed from spawning ground scales led to substantial revisions of racial composition estimates. For example, gross escapement estimates for Chilko sockeye increased 79%, while estimates for Seymour/Scotch and Adams/Lower Shuswap sockeye decreased 45% and 30%, respectively.

The return abundances of all four sockeye run-timing groups and of Fraser River pink salmon were less than forecast. The return of Early Stuart sockeye (171,000) was about half the pre-season forecast, Early Summer-run abundance (384,000 fish) was about 80% of the forecast, Summer-run sockeye abundance (1,774,000 fish) was 33% of the forecast, and the Late-run return (1,310,000 fish) was 62% of the forecast. Chilko sockeye dominated the Summer-run return with an abundance of 1,125,000 and Adams/Lower Shuswap sockeye the Late-run return at 772,000 fish. The return of Fraser River pink salmon totalled 3,593,000 fish, or 44% of the forecast.

Preliminary estimates of spawning escapements to streams in the Fraser River watershed totalled 1,833,000 adult sockeye. This escapement was 5% larger than the brood year (1995) escapement of 1,731,000 adults and was the second largest escapement recorded on the cycle. An increase in the escapement of Chilko sockeye was responsible for the large total escapement. Compared to the brood year, escapements were 80% less for Early Stuart, 36% less for Early Summer, 38% more for Summer and 19% less for Late-run sockeye. Pink salmon spawning escapements totalled 3,430,000 fish. Elevated levels of pre-spawn mortality were observed in many sockeye spawning areas. The success of female sockeye spawning in the entire watershed averaged 90%.

Substantial en route mortalities of sockeye salmon were observed in the Fraser River, along tributary migration routes and in terminal areas in 1999. For early and mid summer stocks, the high mortality rate was due to unusually high river discharges during the upstream migration period. Such high flows create obstructions to fish passage in the Fraser Canyon and delay or impede migration at other sites in the Fraser watershed.

For Late-run fish, the high mortality was due to an unexplained very early migration into the river and an outbreak of the myxosporean parasite, *Parvicapsula minibicornis*. Estimates of en route mortality by run-timing group are 139,000 Early Stuart, 200,000 Early Summer, 194,000 Summer and 716,000 Late-run sockeye, for a total of 1,249,000 fish.

Adjusted gross escapement targets (target + management adjustment) for sockeye salmon were nearly achieved or exceeded for each run-timing group based on lower river estimates (in-season Mission escapement plus First Nations' catch below Mission). Early Stuart and Early Summer gross escapements were both very close to the targets, while gross escapements of Summer and Late-run sockeye were 96,000 (8%) and 603,000 (68%) above the targets, respectively. The total gross escapement exceeded the target by 696,000 sockeye.

Upriver estimates of total sockeye gross escapement (catch plus spawning escapement) were 466,000 fish less than the total unadjusted target. By run-timing group, the escapements of Early Stuart, Early Summer and Late-run sockeye were 105,000 less (79%), 205,000 less (55%) and 446,000 less (50%) than the targets, respectively. Escapements of Summer-run stocks were 290,000 more (20%) than the target. The shortfalls in escapements were due to the large en route mortalities that occurred in 1999, which were not included in upstream estimates. The gross escapement of Fraser River pink salmon (3,501,000 fish) was considerably less than the target of 6,040,000 fish, due to the much lower-than-forecast total return.

The achievement of international allocation targets was severely impacted by the almost complete closures of commercial fisheries. For Fraser River sockeye salmon, the United States caught 20,000 of their share of 46,000 fish, or 9.7% of the TAC compared to their allocation of 22.4%. With respect to Fraser River pink salmon, the United States caught only 17,000 (11.5% of the TAC) of their allocation of 38,000 fish (25.7% of the TAC).

Domestic allocation goals could not be achieved in either country, again due to the extensive restrictions on fisheries.

(Source Document) *Draft Report of the Fraser River Panel to the Pacific Salmon Commission on the 1999 Fraser River Sockeye Salmon Fishing Season*. PSC Staff. November, 2000.

B. 1999 POST-SEASON REPORT FOR CANADIAN TREATY LIMIT FISHERIES

Fisheries in 1999 were conducted according to new Annex IV arrangements under the Pacific Salmon Treaty that was transmitted in a letter from the negotiators on June 23, 1999. The conservation-based approach commits the two Parties to abundance-based management for all stocks covered by the Treaty.

Catch and escapement information is preliminary and is based on the most recent information available. Very limited escapement information is available for later timed coho and chum in southern B.C.

The expectations, management objectives, catches and escapements are only for those stocks and fisheries covered by the Pacific Salmon Treaty (PST); domestic catch allocations have been excluded. Catches in Canadian fisheries that have at some time been under limits imposed by the PST, are included at the end of this section (Table 4).

Transboundary Rivers

Stikine River

Canada developed a fishing plan for the Stikine River based on the new catch sharing arrangements outlined in Chapter 1 para. 3. Accordingly, the objectives of the 1999 management plan were as follows: to harvest 50% of the total allowable catch (TAC) of Stikine River sockeye salmon in existing fisheries; to allow additional sockeye harvesting opportunities in terminal areas to target sockeye salmon that were surplus to spawning requirements; to harvest 4,000 coho salmon in a directed coho fishery; and, to allow chinook salmon to be taken in the commercial fishery only as an incidental catch in the directed fishery for sockeye salmon. The 1999 season opened on 20 June, statistical week 26, and ended in statistical week 37 (week ending September 11).

Sockeye salmon

The preseason forecast of returning Stikine sockeye salmon, as provided by the Transboundary Rivers Technical Committee (TRTC), was 126,000 fish, including 64,000 Tahltan Lake origin sockeye (61,000 wild and 3,000 enhanced), 29,000 enhanced Tuya Lake origin sockeye, and 33,000 non-Tahltan wild sockeye. For comparison, the previous 10-year (1989-1998) average terminal run size was approximately 202,200 fish.

A total of 38,055 sockeye was caught in the combined Canadian commercial and aboriginal fishery; 87.2% of the catch occurred in the commercial fishery. The total catch was approximately 9% below the previous 10-year average (1989-1998) of 41,700 sockeye. The preliminary estimate of the total contribution of sockeye from the Canada/U.S. enhancement program to the combined Canadian aboriginal and commercial fisheries is 12,392 fish, close to 33% of the catch. An additional 2,822 sockeye salmon were taken by the Tahltan First Nation under an "Excess Salmon to Spawning Requirements License" (ESSR) which permitted the terminal harvest of enhanced sockeye in the Tuya River.

A total of 10,748 sockeye salmon was counted through the Tahltan Lake weir in 1999, which was 70% below the previous 10-year (1989-1998) average of 35,297 sockeye. An estimated 623 (6%) of the fish originated from the enhancement program. Of the total number of fish enumerated through the weir, 1,435 females and 1,435 males were collected for hatchery brood stock. In addition to the brood stock collection, 426 sockeye salmon were sacrificed for otolith collection leaving a spawning escapement of 7,452 fish. This escapement is well below the spawning escapement goal of 20,000 fish for Tahltan Lake sockeye salmon.

The spawning escapements for the non-Tahltan and Tuya sockeye stock groups are estimated indirectly by computing the ratio of Tahltan-to-non Tahltan and Tahltan-to-Tuya components in the total in-river sockeye run. Preliminary post-season escapement estimates include approximately 6,800 non-Tahltan fish and 3,500 Tuya fish based on egg diameter measurements and otolith thermal mark ratios. The preliminary estimate for the non-Tahltan sockeye escapement is well below the 30,000 escapement goal for this stock grouping, and 85% below the previous 10-year (1989-1998) average of 44,723 sockeye. The final postseason estimate will be computed after the results from postseason stock identification studies have been completed. Aerial surveys of non-Tahltan sockeye escapement index areas also indicated a below average number of spawners. The 1999 cumulative spawning index count was 24% below the previous 10-year average.

The preliminary post-season estimate of the terminal sockeye run size[1] is approximately 127,000 fish including 61,000 Tahltan Lake sockeye, 35,000 Tuya Lake sockeye, and 31,000 sockeye of the non-Tahltan stock aggregate. A Stikine run size of this magnitude is 37% below the 1989-1998 average terminal run size of 202,192 sockeye salmon. The preliminary post-season estimate of the TAC for 1999 is approximately 59,000 sockeye. The preliminary post-season estimates of run size and TAC are well below in-season predictions. For example, the final in-season forecast generated by the Stikine Management Model (SMM) indicated a run size of approximately 205,900 sockeye and a TAC for Canada of approximately 65,200 sockeye. There was no indication from the SMM throughout the season that the escapement goals would not be achieved.

Coho salmon

Poor sockeye catches in the lower Stikine commercial fishery in August contributed to reduced fishing effort at the beginning of the coho season. This, combined with late coho salmon run timing resulted in the lowest catch of coho salmon since 1985. The total catch for the season was 181 coho, 96% below the 1989-1998 average of 2,658 coho salmon. All of the coho were taken in the lower Stikine commercial fishery. To assess the relative abundance of salmon in the lower Stikine, a coho test fishery was re-established in 1999. The cumulative weekly coho catch per unit effort (CPUE) in the test fishery was 6% above average. However, the 1999 aerial survey index result of 3,872 coho salmon was a record count, 44% above the previous 10-year (1989-1998) average of 2,696 coho salmon. Survey conditions in 1999 were exceptionally good.

Chinook salmon

The total gillnet catch of chinook salmon in the combined aboriginal and commercial fisheries included 2,916 adults and a record 1,264 jacks compared to 1989-1998 averages of 2,263 large chinook and 480 jacks. The count of 4,738 large chinook salmon through the Little Tahltan River weir was 16% below the previous 10-year (1989-1998) average of 5,320 large fish but 18% above the revised Little Tahltan minimum escapement goal of 4,000 chinook salmon. The count of jack chinook salmon was 202 fish, 44% above the previous 10-year average of 140 fish. Results from aerial and foot surveys conducted on Stikine River tributaries also indicated below average chinook escapements in 1999.

---

[1] Terminal run size estimate excludes U.S. interceptions that occur outside of the District 108 and 106 gillnet fisheries

Joint sockeye enhancement

Joint Canada/U.S. enhancement activities continued in 1999 with approximately 4.182 million sockeye eggs collected at Tahltan Lake and flown to the Port Snettisham hatchery in Alaska for incubation and thermal marking. The egg collection target of 6.0 million eggs was not achieved because of below average escapement into Tahltan Lake. Approximately 1.663 million fry were out-planted into Tahltan Lake and 1.603 million fry into Tuya Lake in 1999. The fry originated from the 1998 egg-take at Tahltan Lake and were mass-marked in the hatchery with thermally induced otolith marks. A total of approximately 762,000 sockeye smolts was enumerated emigrating from Tahltan Lake in 1999, 36% below the 1989-98 average smolt count of 1,184,402 sockeye. The contribution of enhanced sockeye to this count has not yet been determined.

Taku River

As with the Stikine River, the fishing plan developed by Canada for the Taku River was based on the new arrangements in Annex IV, Chapter 1, Paragraph 3 of the Pacific Salmon Treaty. Accordingly, the plan addressed conservation requirements and contained the following harvest objectives: to harvest 18% of the TAC of Taku River sockeye salmon plus up to 20% of the sockeye escapement in excess of 100,000 fish; to harvest 3,000 to 10,000 coho salmon, depending on in-river run size forecasts, in a directed coho fishery, and; to allow commercial chinook catches to be taken only incidentally in the directed sockeye fishery. The 1999 season opened on 20 June, statistical week 26, and ended in statistical week 37 (week ending September 11).

Sockeye salmon

The Canadian pre-season forecast was for a sockeye run of approximately 202,900 sockeye, 17% lower than the previous 10-year average run size of approximately 246,000 sockeye.

The 1999 Canadian sockeye catch totaled 21,181 sockeye, 20,799 of which were caught in the commercial fishery. The commercial catch was 22% below the 1989-1998 average of 26,649 sockeye. Enhanced sockeye returns were expected to be low in 1999. The preliminary estimate of the contribution of sockeye salmon from the Canada/U.S. enhancement program to Canadian fisheries is 292 fish.

The estimated total escapement of 103,513 sockeye salmon in the Canadian section of the Taku River, derived from post-season analyses of Canada/U.S. mark-recapture data, is above the interim escapement goal range of 71,000 to 80,000 fish and is close to the previous 10-year average of 102,200 sockeye. Based on weir counts, escapements to the Little Trapper and Tatsamenie lake systems were 11,791 and 2,311 sockeye, respectively. The Little Trapper count was 1% below the 1989-1998 average. The Tatsamenie count was the lowest recorded (68% below average) since the weir was established in this location in 1994. Conversely, a record count of 9,931 sockeye was enumerated at Kuthai Lake, nearly twice the previous 5-year average.

In-season projections of the total run size, TAC, and total escapement were made frequently throughout the season based on the joint Canada/U.S. mark-recapture program, the estimated interception of Taku River sockeye in U.S. fisheries, the catch in the Canadian in-river fishery, and historical run timing information. The final in-season forecast indicated a total run of approximately 198,300 sockeye and a total spawning escapement of approximately 100,700 sockeye. The preliminary post season estimate of total run size is approximately 190,700 sockeye with a TAC of 110,700 to 119,700 sockeye. Preliminary analysis indicates that the Canadian sockeye catch represented 18-19% of the TAC.

Coho salmon

The commercial coho catch of 4,417 fish was approximately 20% below the 1989-1998 average catch of 5,551 coho salmon. Preliminary mark-recapture data indicated a spawning escapement of 64,445 coho in 1999. This estimate exceeds the interim escapement goal range of 27,500 to 35,000 coho salmon but is 11% below the previous 10-year average of 72,700 fish. The preliminary estimate of the total in-river run into the Canadian section of the drainage was 70,021 coho. According to the new harvest arrangements for Taku coho salmon, Canadian fishers were entitled to harvest up to 7,500 coho at a run size of this magnitude. However, late run timing and forecasts in early September that were consistently less than the 50,000 coho salmon threshold (which meant a directed Canadian coho catch of only 3,000 coho), resulted in the closure of the fishery after week 37, i.e. September 11.

Chinook salmon

The commercial catch of large chinook, 907 fish, was 46% below the 1989-1998 average of 1,665 fish; the catch of 226 chinook jacks was 13% above average. Chinook escapement counts were below average in all six of the Taku River aerial index areas surveyed. The combined index count of 4,172 was 64% below the previous 10-year average of 11,474 chinook, and marked the lowest count since 1985. A mark-recapture study involving a test fishery was conducted in 1999 but results are not yet available. After extensive review, the chinook escapement goal was revised in 1999 to a range of 30,000 to 55,000 large chinook salmon; this translates into an aerial index escapement goal of approximately 6,000 to 11,000 fish.

Joint sockeye enhancement

Joint Canada/U.S. enhancement activities continued in 1999 with 0.472 million sockeye eggs taken from the Tatsamenie Lake stock. The number was significantly below the target of 2.5 million eggs due to an escapement shortfall. The eggs were flown to the Port Snettisham hatchery in Alaska for incubation and thermal marking. Approximately 1.8 million sockeye fry from the 1998 egg-takes were out-planted into Tatsamenie Lake in June of 1999. The fry were mass-marked with a thermally-induced otolith mark. As in 1998, all fry were released in nearshore areas and a portion of the fry was fed to determine if this would improve the fry-to-smolt survival. Preliminary information suggests that the fed fry had a fry-to-smolt survival of approximately 13% compared to 2% for unfed fry. The estimated sockeye smolt run in 1999 was 776,000 fish, of which approximately 92,000 were enhanced smolts.

Alsek River

Although catch sharing of Alsek salmon stocks between Canada and the U.S. has not been specified, Annex IV of the Pacific Salmon Treaty does call for a cooperative development of abundance based management regimes for Alsek chinook, sockeye and coho stocks. Interim escapement goal ranges for Alsek sockeye and coho salmon were initially set by the TRTC at 33,000 to 58,000 sockeye salmon, and 5,400 to 25,000 coho salmon. However, stock assessment projects to determine system-wide escapements have not yet been developed. Instead, the principle escapement-monitoring tool for chinook, sockeye and coho salmon stocks on the Alsek River is the Klukshu River weir, operated by DFO and the Champagne-Aishihik First Nation. To make the management objectives of chinook and sockeye better defined in terms of Klukshu stocks, revised goals, expressed in terms of Klukshu stocks only, were tentatively established for 1999.

Canadian and U.S. managers agreed to a minimum escapement goal of 1,100 chinook for the Klukshu drainage for the 1999 season. For sockeye salmon, the following minimum escapement objectives were established: a) a minimum 9,500 sockeye salmon for the total sockeye run through the Klukshu weir; and, b) a minimum 1,500 sockeye for the early run, (i.e., sockeye migrating through the weir prior to August 15). These targets were to be considered interim only and subject to further revision.

A total of 235 chinook was harvested in the aboriginal fishery which was below the 10-year average (1989-1998) of 295 fish. Due to weak returns of early- and late-run sockeye salmon, the aboriginal basic needs levels of sockeye salmon were not achieved. The aboriginal fishery harvested an estimated 506 sockeye which is below the 10-year average (1989-1998) of 1,697 fish, the lowest catch on record. No coho were harvested in the aboriginal fishery.

The sport fishery harvested 112 chinook which is the lowest catch on record. The sport sockeye fishery was closed. A low coho catch of 20 fish was attributed to extensive closures that were implemented due to conservation concerns for sockeye salmon. This was the third consecutive year that major closures have been imposed on the fishery.

The weir count of chinook salmon was 2,193 fish, 24% below the previous 10-year (1989-1998) average of 2,899 fish. The spawning escapement of 2,168 chinook salmon above the weir achieved the minimum escapement goal of 1,100 Klukshu chinook salmon. Aerial chinook surveys were again flown in 1999. The count of 194 chinook salmon in the Takhanne River was 12% below the 10-year average (1988-1997) of 220 fish. An aerial count of 371 chinook salmon in the Blanchard River was 52% above the 10-year average of 244 chinook salmon. A total of 51 chinook salmon was observed at Goat Creek, 34% above the average of 38 fish.

The weir count and total escapement of Klukshu River sockeye salmon was 5,381 and 5,101 fish, respectively. The early-run count of 371 sockeye was 90% below the previous 10-year (1989-1998) average of 3,755 fish, and the late-run count of 5,010 fish was 63% below the previous 10-year average of 13,661 sockeye salmon. The early and total sockeye runs did not achieve the minimum spawning escapement goals of 1,500 and 9,500 sockeye, respectively. An estimate of the 1999 Village Creek sockeye salmon escapement is unavailable due to major equipment failures in 1999.

The Klukshu weir count of 2,531 coho salmon was near the 10-year average count (1989-1998) of 2,617 fish. The weir is usually removed prior to the completion of the coho return due to icing conditions and does not include fish that migrate after mid-October.

Northern British Columbia Pink Salmon

Areas 3-1 to 3-4 Pink Net Catch

The 1999 Treaty Annex IV provisions stated that Canada was to manage the 3-1 to 3-4 net fishery to achieve an annual catch share of 2.49 percent of the Annual Allowable Harvest (AAH) of Alaskan Districts 101, 102 and 103 pink salmon. Due to the serious conservation concerns for Upper Skeena River coho and sockeye in 1999, the majority of Sub-area 3-3 and all of Sub-areas 3-1, 3-2, and 3-4 was closed for the entire season.

A well below average return of pink salmon was anticipated for Canadian northern boundary area stocks as a result of poor escapements in the brood year (1997). However, the actual return was much larger than forecast, producing a total Area 3 net catch of 5.3 million.

The Canadian pink catch in 1999 in Sub-areas 3-1 to 3-4 was 2,162,280 and the AK stock component of this is estimated to be 1,353,783 based on racial analysis of catch. The AAH of Alaskan Districts 101, 102, and 103 pink salmon is estimated to be 42,651, 030, which results in a Canadian catch share of 3.17%.

The total Canadian pink catch of 2.2M in sub-areas 3-1 to 3-4 is 47% higher than the 1985-98 average catch of 1.5 million. The percentage of the 1999 Area 3 net catch taken in sub-areas (1-4) was 40%, which was well below both the 1985-98 average of 61% and the pre-Treaty (pre-1985) average of 73%.

Pink escapements in 1999 in Areas 3, 4 and 5 were above target for most systems.

Area 1 Pink Troll Catch

The Canadian troll fishery in Area 1 was closed for the season due to conservation concerns for Skeena River coho. A limited troll test fishery was conducted with six vessels participating from July 15 to July 27 and from August 17 to September 3. A total of 24,592 pink salmon was harvested in this fishery, of which 20,790 were estimated to be of AK origin. The % of the AK AAH was therefore 0.05, which is well below the 1999 treaty agreement for 2.57 percent of the AAH of Alaskan Districts 101, 102 and 103 pink salmon return in 1999. This equates to an additional 1,075,341 District 101 to 103 pink salmon available for harvest in 2000.

Chinook Salmon

North Coast Troll (Areas 1 to 5) and Queen Charlotte Island Sport (Areas 1 and 2)

The preliminary troll catch of 44,572 chinook (>5 lb.), and the preliminary sport catch of 25,800 gives a combined North Coast catch of 70,372.

The 1999 North Coast chinook catch is significantly lower than that of 1998 (144,650).

This can be attributed to the reduced TAC for northern troll in response to conservation concerns for WCVI chinook stocks. The troll fishery was open for chinook salmon from August 1 to August 15. Under the new Annex IV provisions, the North Coast aggregate abundance-based management regimes (AABM) for troll and sport gear in 1999 could have gone as high as 145,000 chinook, as estimated by the PSC Chinook Technical Committee (CTC) chinook model.

Based on preliminary information, chinook escapement to the Nass is below average, while that to the Skeena is slightly below/similar to 1998. The Kitimat River escapement was down from 1998, while that to the Atnarko River was higher than the previous year and considered average to good.

West Coast Vancouver Island Troll (Areas 21, 23 to 27, 121 to 127) and Outside Sport

In 1999, Canada's principal management objective was to address conservation concerns for returning WCVI chinook stocks during the summer season. Based on stream enumeration work and CWT analyses, mature WCVI chinook are rarely encountered offshore after September; by then they are in freshwater. The objective for the troll fishery was to manage for a complete closure for chinook (non-retention and non-possession) during this period. In addition, severe coho conservation concerns prevented troll fishing opportunities for salmonids other than coho and chinook. Except for a few terminal areas, mandatory non-retention of coho was in effect for 1999.

In 1999, one troll opening took place off WCVI from October 1 to 22. This pilot fishery was the second year of a three-year WCVI winter chinook fishery. The minimum size for commercially caught chinook was reduced from a fork length of 67cm to 55cm. All troll vessels used single barbless hooks; had onboard, functional "revival tanks" for coho; carried log books; and vessel masters were required to phone in their catch on a daily basis. Also, the vessel masters were required to notify the department of the start and end of each trip allowing port samplers to sample chinook from specific trips.

Observers onboard selected vessels recorded catch (by-catch) and collected biological and stock composition samples (CWT and DNA). The preliminary catch of chinook was 56,000 fish (from hail-in / logbook and observer program data).

WCVI Outside Sport catches of chinook are as follows:

- Area 121-124, 21-24 to July 31 = 10,421
- Area 121-124 from Aug. 1 to Oct. 15 = 6,027
- Area 125-127, 25-27 to June 30 = 696
- Area 125-127 from July 1 to Oct. 15 = 0

Total 17,144

Under the new Annex IV provisions the WCVI outside troll and sport AABM fishery in 1999 could have been as high as 128,000 chinook, based on the abundance level estimated from the CTC chinook model.

Strait of Georgia Troll and Sport (Areas 13 to 19, 20-5 to 20-7, 28 and 29)

Troll Fishery

In response to conservation concerns for the Lower Georgia Strait (LGS) chinook stocks, Canada continued a series of area and gear-specific management actions to reduce the LGS harvest rate. The management plan was designed to meet Canada's general obligation to manage sport and commercial individual stock-based management regimes (ISBM) fisheries by reducing the total equivalent adult mortality rate relative to the 1979-82 base period by 36.5%, as outlined in the new Annex IV (Chapter 3) for chinook salmon intercepted in ISBM fisheries.

In 1999, there was to be no directed chinook troll fishery in the Strait of Georgia. However, chinook retention was to be permitted as an incidental catch during directed sockeye and chum fisheries. Non-retention of chinook was to be in effect during the mainland inlet pink fisheries. In addition, non-retention of chinook would be implemented if unacceptable by-catch levels were encountered in any directed fisheries.

It was expected that non-retention of coho and limitations on coho mortalities would considerably reduce the effectiveness of directed fisheries on other species and the length of the chinook by-catch period. Measures to protect coho also protected chinook stocks. Management actions directed at the troll fleet for 1999 would require mandatory use of single, barbless hooks, revival tanks for coho, logbooks and hailing catches on a regular basis, on-board observers on vessels when requested as part of the DFO monitoring program, and test fishing prior to openings to identify areas with high coho encounters. In 1999 low run size estimates for summer sockeye and fall chum precluded any commercial fishing opportunities for the troll fleet in the Strait of Georgia.

Sport Fishery

The 1999 chinook management plan for chinook sport fisheries in the Strait of Georgia and Juan de Fuca Strait involved slot size limits for the first time. Maximum size limits were implemented to reduce the harvest rate on mature spring chinook, in particular Nooksack River chinook. In the Strait of Georgia (from Cadboro Point north to Seymour Narrows), the plan included an annual catch limit of 15 chinook, a daily bag limit of two, and a slot size limit (minimum size of 62 cm fork length, 77 cm fork length maximum size) in effect between February 15 and May 20, 1999. In Juan de Fuca Strait from Cadboro Point to Bonilla Point, the plan included an annual limit of 20 chinook, a daily bag limit of two, and a slot size limit (minimum size of 45 cm fork length, 77 cm fork length maximum size) in effect between February 15 and May 20, 1999. Before and after these dates, the maximum size limit was not a regulation during 1999.

In order to address southern B.C. coho conservation requirements, the Strait of Georgia was divided into red, yellow and special management zones. Red zones were areas where upper Thompson River coho stocks were particularly prevalent and strict coho non-retention was required. Salmon fishing was restricted to very limited experimental selective fisheries, as well as some limited First Nations fisheries to meet food, social and ceremonial requirements. Yellow zones, in very limited inside waters, were those areas where selective fishing opportunities for all species were available, subject to local restrictions. They were areas where stocks of concern were not prevalent. In these zones, selective fishing opportunities were allowed for all species. Limited coho retention was allowed for First Nations and recreational fisheries. Special management zones (SMZs) were areas of mandatory coho non-retention where special restrictions applied. Fisheries were only permitted in locations and during times when Thompson River coho and other salmon stocks of concern could be avoided or released alive and unharmed. These areas were subject to in-season adjustments, including time and area closures for all sectors (First Nations, commercial and recreational) and were subject to monitoring and enforcement. The management intent in special management zones was to avoid coho encounters.

Selected portions of the southern Strait of Georgia in Areas 19, 20, 21 and 28 (September 1-30) were designated a red zone and were restricted to fishing only from June to September. The majority of the remaining areas in the Strait of Georgia, including the selected surfline ribbon boundary areas in Areas 19, 20 and 21, were designated special management zones. There were four areas (Areas 16, 20, 28 and 29) designated yellow zones. The non-tidal portion of the Fraser River (Area 29) was designated a special management zone to August 31 and a red zone from September 1-30. After October 1, all red zones in tidal waters switched to a yellow zone designation, which permitted chinook retention but prohibited coho retention. In portions of Areas 13 and 14 retention of marked (hatchery) coho (2/day) was permitted in September and October.

Non-retention of coho and limitations on coho mortalities considerably reduced the effectiveness of the sport fishery for chinook. Additional management actions directed at the sport fishery were the mandatory use of barbless hooks, monitors at boat ramps to check the catch, and, observers onboard selected sport vessels to monitor the coho by-catch and collect biological data.

The 1999 preliminary sport catch for the Strait of Georgia is 52,027 chinook based on creel survey results. The 1999 creel survey started April 1 and ended October 31. Sport effort (# of boat trips) in 1999 increased by 24.6% over the 1998 level.

Fraser River Sockeye and Pink Salmon

Under the new Annex IV provisions, the U.S. share of the annual Fraser River sockeye and pink salmon total allowable catch (TAC) to be harvested in the waters of Washington State was 22.4% and 25.7% respectively. The Fraser River Panel developed a pre-season fishing plan based on: a forecast return of 8,248,000 sockeye and 8,148,000 pink salmon, escapement targets of 2,687,000 sockeye and 6,000,000 pink salmon, a forecast of diversion through Johnstone Strait of 16%, and a forecast of near normal timed returns for Early Stuart, Summer and Late Run sockeye stock groups and pink salmon. The TAC calculation included management adjustments for Early Stuart and Early Summer sockeye stock groups to account for natural, environmental, and stock assessment factors in order to increase the probability that escapement target levels were reached.

Additional elements of the Canadian fishing plan addressed conservation concerns for other species, a provision for fulfilling obligations to First Nations both in and outside the Fraser River, a commercial allocation structure, and a provision for recreational fishing opportunities.

To address the continuing concern for Thompson River coho in 1999 that required a target of zero mortality in all fisheries, a series of restrictive measures was implemented in all fisheries that were expected to encounter coho salmon. Time, area, and gear restrictions, and prescribed fishing practices were included in regulatory provisions of most fisheries. Area B seine and Area E gillnet fisheries were excluded from Juan de Fuca Strait; and the Area E gillnet fishery in Georgia Strait and Fraser River was restricted to openings in periods prior to early September. Recreational and aboriginal fisheries were subjected to complimentary restrictions. Conservation measures were also implemented in Johnstone Strait to address Nimpkish sockeye salmon concerns and in the Fraser River to address steelhead and Harrison River chinook salmon conservation concerns.

The majority of fishing opportunities was expected on the Mid-summer and Late Run stock groups in marine approach areas, and on Mid-summer run sockeye salmon in the Fraser River. Limited opportunities for Fraser River sockeye salmon were also expected for Area F troll fisheries in Northern B.C.

Management of fisheries during the season and escapements were adversely affected by a number of factors: estimates of in-season returns were significantly below forecast levels, thereby reducing TACs; record high discharges in the Fraser River apparently caused substantial en-route mortalities for the Early Stuart and Early Summer run stock groups, and; significant pre-spawning mortality was observed for the Weaver Creek, Adams River, Cultus Lake and Harrison River (late runs overall) sockeye runs, which experienced very early run timing.

Based on preliminary estimates of catch and the PSC staff's in-season assessment of gross escapement to the Fraser River, the sockeye return was 3,520,000, comprised of 150,000 Early Stuart, 470,000 Early Summer, 1,300,000 Summer, and 1,600,000 Late run sockeye. For pink salmon, the Fraser Panel adopted the pre-season forecast for the purposes of in-season management.

Preliminary estimates of Fraser River sockeye catch totalled 527,400 fish: 53,900 fish in Canadian commercial fisheries (not including aboriginal pilot sales), 19,800 fish in U.S. Treaty Indian and non-Indian fisheries in Washington state, 21,500 in Alaska, and 333,300 fish in Canadian aboriginal fisheries. The remaining catch of 98,900 sockeye was accounted for primarily in test fisheries.

Preliminary estimates of Fraser River pink catch totalled 68,400 fish: 3,300 fish in Canadian commercial fisheries (not including aboriginal pilot sales), 2,700 fish in U.S. Treaty Indian and non-Indian fisheries in Washington state, and 49,500 fish in Canadian aboriginal fisheries. The remaining catch of 12,900 sockeye was accounted for primarily in test fisheries.

Canada has released preliminary information on sockeye spawning escapements. Preliminary estimates are 24,500 Early Stuart, 101,500 Early Summer, and 1,328,000 Mid-summer Run sockeye. Preliminary escapements are not yet available for Late Run sockeye and pink salmon.

Coho Salmon

Forecasting the 1999 abundance of coho salmon in southern BC was extremely difficult, especially given the paucity of fisheries information available for 1998, and the reliance on this information in the time series models used. Based on these analyses, approximately 200,000 coho were forecast to return to the Strait of Georgia aggregate, of which approximately 28,000 were destined for the interior of the Fraser watershed, including the Thompson River drainage. This forecast represented a further deterioration in the status of Strait of Georgia wild coho. The forecast for coho returning to the West Coast of Vancouver Island in 1999 was approximately 450,000. This was 77% of the 1984 to 1998 average abundance, and similar to the 1998 return.

Declines in numbers of coho in southern BC are the result of reduced marine survivals, past fishing levels exceeding those that many stocks were able to withstand, and freshwater habitat alterations. Natural survival rates in the ocean have declined by approximately an order of magnitude in the last 15 years, and this is the primary reason for reduced coho abundance. Although Fisheries and Oceans have made major reductions in the numbers of coho salmon harvested (killed), benefits to the resource have been minimal due to the continued low survival rates. Marine survival forecasts for coho returning in 1999 were mixed, but generally poor.

In seven of the last nine years, most Strait of Georgia coho were caught outside the Strait, presumably moving outside during their first year in the ocean. In 1999, Fisheries and Oceans Canada forecasted a moderately strong outside distribution. Evidence to date indicates that there was a high outside distribution in 1999. This means that Strait of Georgia (including Fraser River) coho were essentially unavailable to Strait of Georgia fisheries until their spawning migration in the fall.

Fisheries and Oceans recommended that, given the current low productivity of the Strait of Georgia-Fraser River coho aggregate, and its overall poor stock status, fishing mortality should be kept to a minimum to conserve and maximize the potential to rebuild these stocks. The department recommended a continuation of the cautious approach to managing fisheries that encounter West Coast Vancouver Island coho given the uncertainty about the productivity and overall status of these stocks.

To ensure the maximum possibility of achieving conservation needs for Thompson River coho stocks, Fisheries and Oceans in 1999 again had a goal of zero fishing mortality in Canadian fisheries on these fish. As described earlier in the chinook section, salmon fisheries in 1999 were managed with respect to three areas or zones - red, yellow and special management zones.

Preliminary estimates of coho encounters and coho mortalities for all fisheries that took place in red, yellow and special management zones are presented in Table 1. The coho estimates are 96.3K encounters and 23.3K mortalities to November 13, 1999. A summary of the preliminary estimates of coho encounters and mortalities by the commercial fisheries (troll, seine, and gillnet) is presented in Table 2.

Table 1. Preliminary summary of 1999 coho total mortality by sector and zone for South Coast British Columbia (Note: estimates are to November 13).

YELLOW ZONE FISHERY	Total Coho Encounters	Estimated Coho Mortalities
Recreational	6,804	6,129
Commercial	3,818	1,113
Test Fisheries	1,369	385
Yellow Total	**11,991**	**7,627**
SM ZONE FISHERY		
Aboriginal	8,442	4,829
Recreational	61,124	6,112
Commercial	243	130
Test Fisheries	2,073	764
Experimental	6,472	1,608
SM ZONE Total	**78,354**	**13,443**
RED ZONE FISHERY		
Test Fisheries	4,675	2,023
Experimental	1,293	156
RED ZONE Total	**5,968**	**2,179**
Yellow/SMZ/Red Total	**96,313**	**23,249**

Table 2. Preliminary estimates of 1999 coho encounters and mortalities in the commercial fisheries for South Coast British Columbia. (Note: estimates are to November 13)

FISHING AREA	Coho Encounters	Coho Mortalities
Subtotal - Yellow Zone TROLL	3,463	900
Subtotal - SM Zone TROLL	58	15
Total TROLL	**3,521**	**915**
Subtotal - Yellow Zone SEINE	0	0
Subtotal - SM Zone SEINE	0	0
Total SEINE	**0**	**0**
Subtotal - Yellow Zone GILLNET	355	213
Subtotal - SM Zone GILLNET	185	115
Total GILLNET	**540**	**328**
TOTAL ALL GEAR	**4,061**	**1,243**

Area 20 Net Catch

There were no commercial salmon fisheries in Area 20 in 1999.

West Coast Vancouver Island Troll (Areas 21 to 27, 121 to 127 and 130-1)

Canada is committed to developing management measures and programs to prevent further decline in spawning escapements, and to adjust fishing patterns, and initiate, develop, or improve management programs for WCVI coho stocks as outlined in the new Annex IV (Chapter 5). Canada's management plan for coho in 1999 was to continue to address severe conservation concerns for southern B.C. coho stocks. Coho retention was prohibited by any fishing gear in tidal waters coast wide for the 1999 season.

Management actions directed at the WCVI troll fleet for 1999 required all vessels to use single, barbless hooks; mandatory use of revival tanks for coho; mandatory logbooks and hailing of catches on a regular basis; on-board observers when requested as part of the department's monitoring program; and, test fishing prior to openings to identify areas with high coho encounters.

Due to conservation concerns for WCVI chinook stocks during the summer season, and the projected low run sizes for summer run sockeye, no trolling took place off WCVI prior to October1. After October 1, trolling was directed at chinook and chum with mandatory non-retention and non-possession of coho.

Southern British Columbia Chum Salmon

Canada and the United States agreed to implement the sharing arrangement as outlined in the new Annex IV, Chapter 6 of the Pacific Salmon Treaty. The essential elements of the sharing arrangements in Chapter 6 are as follows:

- When the catch in Johnstone Strait is 280,000 chum or less, the US catch of chum in Areas 7 and 7A shall be limited to chum taken incidentally to other species and in other minor fisheries, but shall not exceed 20,000.
- When the catch in Johnstone Strait is from 280,000 to 745,000 chum, the United States catch of chum in Areas 7 and 7A shall not exceed 120,000.
- When the catch in Johnstone Strait is 745,000 chum or greater, the United States catch of chum in Areas 7 and 7A shall not exceed 140,000.

Inside Net (Areas 11 to 19, 28 and 29)

The 1999 pre-season forecast for Study Area (inside) chum stocks was 2.5 million based on 1994-96 brood year returns. This forecast consisted of 1.7 million Fraser and 0.8 million non-Fraser (not including 100 thousand U.S.). The escapement goal for the Clockwork chum salmon stock was 2.0 million.

Johnstone Strait (Areas 12 and 13)

In 1999, the third week of September "Assessment Fishery" was not held due to conservation concerns for coho salmon. This was just one management action taken among a broad spectrum of measures to reduce exploitation on southern B.C. coho stocks. However, this action forced total reliance upon test fishing in Johnstone Strait for assessing the strength of the returning chum run early in the season.

Test fishing commenced on September 15 in Johnstone Strait with one vessel. The second test vessel started September 20. Test fishing catches were moderate in the first week and continued at a similar level into the second week. During the second week one of the test vessels had a very high catch on one day, after which the catches dropped and remained at a moderate level until the start of the fourth week when catches dropped off for the remainder of the season.

On October 7 the run was reassessed resulting in a run size upgrade to 2.9 million from the pre-season forecast of 2.5 million. Under the Clockwork Strategy a run size less than 3.0 million kept the Johnstone Strait harvest rate target at 10%. This run size estimate was reviewed weekly, however test fish catches were low indicating a low abundance of fish in Johnstone Strait. As the 2.9 million run size estimate remained unchanged, there was no opportunity for a commercial fishery in Johnstone Strait in 1999.

The total catch of Johnstone Strait chum from the test fishery and Indian Food Fishery (IFF) was 41,411.

There was no harvestable surplus of chum salmon in Nimpkish terminal area in Area 12.

Strait of Georgia (Area 14 to 19)

Test-fishing was continued this year for most areas but no fishable surplus was identified except for Goldstream (Area 19). An ESSR fishery harvested a small surplus of approximately 57,000 chum.

Food, Subsistence, and Ceremonial (FSC)

The First Nations FSC preliminary catches for Areas 16 through 19 are 10, 826, 1050, and 3000 chum respectively.

GSI Sample Collection

To address the proportion of Cowichan and Goldstream chum in the Area 19 ESSR fishery, DNA samples were collected during the fishery. Samples were taken from several sites in Area 19 to assess any stock mixing differences. Analyses are underway. To ensure that the baseline data are current, DNA samples were taken from Goldstream and Cowichan River(s) chum salmon.

Fraser River

Test fishing at Albion began on September 1 and fishery catches totalled 8,776 chum. The run size was lower than the pre-season forecast of 1.9 million. The preliminary total terminal run, including catch, is estimated at 1.2 million, with an early run component of 810,000 and a late run component of 400,000. However, the estimate of the late run component was strongly influenced by the early run size. Catches in the test fishery after

November 5 dropped precipitously and the final late run size estimate was less than 280,000. The preliminary catch for First Nations is 40,000 chum, approximately 2,600 of which were taken in selective fisheries. Another 40,000 chum were taken in ESSR fisheries. An Area 29 commercial fishery took place on November 3 resulting in a total catch of 30,000 chum.

Experimental fisheries designed to test methods of selectively harvesting chum while releasing other species were undertaken in the Fraser River. The majority of the projects were trials of non-retention equipment. The harvest from these experimental fisheries was less than 5,000 chum.

West Coast Vancouver Island Net (Areas 21 and 22)

Chum salmon returning to Area 22 (Nitinat Lake) are caught in Area 21, parts of Area 121 and potentially in Area 20-1. In 1999, the preseason forecast suggested a harvestable surplus of approximately 700,000 chum salmon based on good escapements in 1994 and 1996 and poor escapement in 1995. Hatchery fry output was 31 million, 25 million, and 32 million, respectively for the 1994, 1995, and 1996 brood years.

The Nitinat escapement objective is 250,000 to a maximum of 350,000. The additional 100,000 above the 250,000 target are used to address hatchery broodstock requirements, to increase distribution of spawners in the Nitinat River, and for payment for in-lake test fishery/brood stock capture activities.

The 1999 fishing plan was based on achieving weekly escapement goals into Nitinat Lake. In addition, the fishing plan again addressed increased requirements to minimize by-catch of chinook, coho and steelhead. The plan was designed to provide early opportunities for gillnets, provide a seine fishery to balance the allocation, and then allow a combined seine and gill net fishery at the peak of the run. Implementation of the plan was based on weekly assessment information from an in-lake test fishery/escapement surveys, a gill net test fishery outside Nitinat Lake in the commercial fishing area, and a seine test fishery outside Nitinat Lake.

The outside gillnet test fishery, initiated in 1995, was continued in 1999 with further modification. The area remained the same as in 1998 and not implemented until September 25 to avoid passing steelhead and coho. This test fishery included 7 vessels each fishing 2 nets in a systematic grid pattern with the objective to determine abundance and distribution of chum and other species. In 1999, each vessel fished one 6 strand Alaska Twist twine net and one multi-strand twine net to test the relative selectivity of each twine type. All nets were hung with a 2-meter weed line to further reduce steelhead bycatch.

To minimize encounters of passing stocks of coho and Thompson River steelhead, the first commercial gill net fishery was delayed until October 4. In addition, the initial fishing area was reduced to within a one mile boundary between lines true south from Pachena and Dare Points, based on information about distribution of passing stocks from previous years gillnet test fisheries. To reduce mortality of coho and steelhead and to improve catch data, the following measures were implemented for the entire season:

- non-retention of coho and steelhead (seine and gillnet)
- mandatory functional revival tanks (seine and gillnet)
- daylight fishing only (gillnet)
- maximum 60 minute set length
- onboard observers (seine and gillnet)
- logbooks and daily hail-ins (seine and gill net). The daily mandatory hail-ins were waived due to technical difficulties.

The fishery was opened to gillnets from October 4 through October 20 (initial 2 day opening with a series of 2 to 3 day extensions). There was no seine fishery, as escapement milestones were not met. Preliminary information indicates a total return of approximately 300,000 chum. Observer information indicated a low incidence of bycatch of non-target species throughout the fishery.

Total commercial gillnet catch was 109,000 plus 9,000 by gillnet test fisheries and 11,000 by seine test fisheries.

Preliminary estimates of total Area 21 catch are shown in Table 3.

Table 3. Preliminary estimates of total Area 21 catch.

	Total days	Boat days	Chum catch	Chinook catch	Released coho	Released chinook	Released steelhead
Gillnet total	17	1,166	108,959	4	184	4	4
Seine total	0	0	0	0	0	0	0
Total Commercial			108,959	4	184	4	4
GN test			8,711	3	53	0	8
SN test			11,000	0	37	1	0
Total A21			128,670	7	274	5	12

A preliminary estimate of total chum salmon escapement into Nitinat Lake (Area 22) is 200,000 including approximately 100,000 natural spawners and 100,000 taken for broodstock, First Nation catch, test fishing. Also included are approximately 5,000 chum lost during a lake turnover. The hatchery egg take was 35 million.

The total Nitinat return was estimated to be approximately 300,000 chum.

No electrophoretic samples were collected in Area 21.

(Source Document) *1999 Post-Season Report for Canadian Treaty Limit Fisheries.* Fisheries and Oceans Canada. December, 1999.

Table 4. Preliminary 1985 to 1999 catches in Canadian Treaty Limit Fisheries.

Fisheries/Stocks	Species	1999##	1998#	1997	1996	1995	1994	1993	1992	1991
Stikine River (all gears)	*Sockeye*	38,055	43,803	65,559	74,281	53,467	45,095	47,197	26,284	22,763
	Coho	181	726	401	1,404	3,418	3,381	2,616	1,855	2,648
	Chinook-large	2,916	2,164	4,483	2,741	1,646	1,790	1,803	1,840	1,511
	Chinook-jack	1,264	423	286	421	860	350	308	239	660
	Pink	11	55	269	25	48	90	29	122	394
	Chum	8	13	222	232	263	173	395	231	208
	Steelhead	14	209	33	183	270	84	67	132	71
Taku River (commercial gillnet)	*Sockeye*	21,181	19,038	24,246	41,665	32,640	28,762	33,217	29,472	25,067
	Coho	4,888	5,090	2,903	5,028	13,629	14,531	3,033	4,077	3,415
	Chinook-large	957	1,107	2,732	3,331	1,577	2,065	1,619	1,445	1,177
	Chinook-jack	226	227	84	144	298	235	171	147	432
	Pink	0	0	0	0	2	168	16	0	296
	Chum	0	2	3	0	1	18	15	7	2
	Steelhead	68	176	183	98	205	232	11	15	5
Areas 3 (1-4)(commercial net)*	*Pink*	2,162,280	61,000	329,000	987,000	2,613,000	262,000	1,242,000	1,099,000	6,961,000
Area 1 (commercial troll)	*Pink*	25,000	0	261,000	732,000	1,284,000	220,000	890,000	760,000	1,647,000
*North Coast** (troll + sport)*	*Chinook*	70,372	144,650	145,568	26,900	119,100	241,000	258,300	262,000	303,200
West Coast Vancouver Island Area 12 (commercial troll)	*Chinook*	56,000	10,284	51,400	0	81,000	146,000	275,000	345,500	202,900
	Chinook	0	0	2,600	0	0	2,200	4,200	2,600	1,000
Georgia Strait (sport) (troll)	*Chinook*	52,027	20,536	56,300	93,800	61,500	70,800	118,800	116,600	112,700
	Chinook	0	587	800	0	0	13,000	33,300	37,300	32,000
	Total	52,027	21,123	57,100	93,800	61,500	83,800	152,100	153,900	144,700
Fraser River Stocks (total Canadian commercial catch)	*Sockeye*	54,000	1,295,000	8,737,000	1,019,000	903,000	9,800,000	13,428,000	3,906,000	6,947,000
	Pink	3,000	0	3,660,000	0	3,777,000	0	3,731,000	0	6,405,000
Fraser River Stocks (total US commercial catch)	*Sockeye*	41,000	707,000	1,578,000	257,000	415,000	2,100,000	2,876,000	700,000	1,881,000
	Pink	3,000	0	1,565,000	0	1,919,000	0	1,725,000	0	2,789,000
West Coast Vancouver Island (commercial troll)	*Coho*	0	0	0	761,000	1,345,000	1,251,000	954,000	1,664,000	1,890,000
*Johnstone Strait (clockwork catch)****	*Chum*	41,411	1,820,000	104,593	101,971	269,000	1,295,600	1,271,700	1,368,283	174,269

# 1998 catches are preliminary

## 1999 catches are based on in-season hails, on-the-grounds counts, dockside tallies and Aboriginal landing slips, fish slip data to Nov. 16 (Transboundary , Nov. 12 (north chinook), Nov. 12 (north pinks), and Oct. 22 (WCVI troll, chinook; Fraser sockeye and pinks from in-season hails and dockside tallies to Sept. 20; southern chum catches from in-season hails and logbooks to Nov. 14; sport catches are from creel survey data to Sept. 30 (Georgia Strait) and to Sept.15 (north chinook)

* Area 5-11 catches included prior to 1995 and excluded from 1995 to 1998 inclusive. Not part of 1999 Annex IV provisions.

** North Coast catch excludes terminal exclusion catches of 4,800 ('89), 5,500 ('90), 6,000 ('91), 6,100 ('92), 7,400 ('93), 6,400 ('94), 1,702 ('95), 16,000 ('96), 5,943 ('97), and 2,182 in 1998. No terminal exclusion in 1999; central coast areas not part of 1999 Annex IV provisions.

*** Canadian clockwork catch includes commercial, IFF and test fish catches in Areas 11-13 and 29 for 1985-87 inclusive, and in Areas 11-13 for 1988-94 inclusive, and in Areas 12-13 for 1995 to 1999 inclusive

Note: bold line between 1998 and 1999 indicates that 1999 catches are reported according to fisheries/stocks under the 1999 Annex IV provisions.

Table 4. Preliminary 1985 to 1999 catches in Canadian Treaty Limit Fisheries, continued.

Fisheries/Stocks	Species	1990	1989	1988	1987	1986	1985
Stikine River	*Sockeye*	18,024	20,032	15,291	9,615	17,434	25,464
(all gears)	*Coho*	4,037	6,098	2,117	5,731	2,280	2,175
	Chinook-large	2,250	2,669	2,360	2,201	1,936	1,111
	Chinook-jack	959	289	444	444	975	185
	Pink	496	825	418	646	107	2,356
	Chum	499	674	733	459	307	536
	Steelhead	199	127	261	219	194	240
Taku River	*Sockeye*	21,100	18,545	12,014	13,554	14,739	14,244
(commercial gillnet)	*Coho*	3,207	2,876	3,123	5,599	1,783	1,770
	Chinook-large	1,258	895	555	127	275	326
	Chinook-jack	128	139	186	106	77	24
	Pink	378	695	1,030	6,250	58	3,373
	Chum	12	42	733	2,270	110	136
	Steelhead	22	24	86	223	48	32
Areas 3 (1-4) and 5-11 (commercial net)	*Pink*	831,000	2,259,000	425,000	1,851,000	1,983,000	1,277,000
Area 1 (commercial troll)	*Pink*	1,165,000	1,377,000	1,630,000	495,000	416,000	687,000
North/Central Coast (commercial/sport)	*Chinook*	253,000	301,200	245,600	282,800	261,000	275,000
West Coast Vancouver Island	*Chinook*	298,000	203,700	408,700	379,000	342,000	358,000
Area 12 (commercial troll)	*Chinook*	2,000	2,000	2,000	2,000	4,000	4,000
Georgia Strait							
(sport)	*Chinook*	112,000	133,000	119,000	121,000	182,000	235,000
(troll)	*Chinook*	34,000	29,000	20,000	39,000	44,000	56,000
	Total	146,000	162,000	139,000	160,000	226,000	291,000
Fraser River Stocks	*Sockeye*	13,411,000	12,776,000	1,615,000	3,776,000	9,372,000	8,754,000
(total Canadian commercial catch)	*Pink*	0	7,181,000	0	2,579,000	0	8,725,000
Fraser River Stocks	*Sockeye*	2,427,000	2,439,000	679,000	1,932,000	2,755,000	2,925,000
(total US commercial catch)	*Pink*	0	2,260,000	0	1,339,000	0	3,834,000
West Coast Vancouver Island (commercial troll)	*Coho*	1,864,000	1,953,000	1,596,000	1,821,000	2,157,000	1,389,000
*Johnstone Strait (clockwork catch)****	*Chum*	1,183,901	481,803	1,111,559	90,668	1,060,903	529,100

# 1998 catches are preliminary

## 1999 catches are based on in-season hails, on-the-grounds counts, dockside tallies and Aboriginal landing slips, fish slip data to Nov. 16 (Transboundary , Nov. 12 (north chinook), Nov. 12 (north pinks), and Oct. 22 (WCVI troll, chinook; Fraser sockeye and pinks from in-season hails and dockside tallies to Sept. 20; southern chum catches from in-season hails and logbooks to Nov. 14; sport catches are from creel survey data to Sept. 30 (Georgia Strait) and to Sept.15 (north chinook)

* Area 5-11 catches included prior to 1995 and excluded from 1995 to 1998 inclusive. Not part of 1999 Annex IV provisions.

** North Coast catch excludes terminal exclusion catches of 4,800 ('89), 5,500 ('90), 6,000 ('91), 6,100 ('92), 7,400 ('93), 6,400 ('94), 1,702 ('95), 16,000 ('96), 5,943 ('97), and 2,182 in 1998. No terminal exclusion in 1999; central coast areas not part of 1999 Annex IV provisions.

*** Canadian clockwork catch includes commercial, IFF and test fish catches in Areas 11-13 and 29 for 1985-87 inclusive, and in Areas 11-13 for 1988-94 inclusive, and in Areas 12-13 for 1995 to 1999 inclusive

Note: bold line between 1998 and 1999 indicates that 1999 catches are reported according to fisheries/stocks under the 1999 Annex IV provisions.

C. PRELIMINARY 1999 POST-SEASON REPORT FOR UNITED STATES SALMON FISHERIES OF RELEVANCE TO THE PACIFIC SALMON TREATY

Northern Boundary Area Fisheries

District 104 Purse Seine Fishery

The June 30, 1999 revision of the Pacific Salmon Treaty Agreement calls for the implementation of abundance based management in the District 104 purse seine fishery. The agreement allows the District 104 purse seine fishery to harvest 2.45 percent of the Annual Allowable Harvest (AAH) of Nass and Skeena sockeye prior to statistical week 31. The AAH is calculated as the total run of Nass and Skeena sockeye salmon minus either the escapement requirement of 1.1 million or the actual inriver escapement, whichever is less.

The pre-Week 31 fishing plan for District 104 was based on the preseason forecast of Nass and Skeena sockeye salmon provided by the Canadian Department of Fisheries and Oceans (DFO). The Nass run was forecasted to be 750,000 with an escapement goal of 200,000. However, the Skeena run was forecasted to be below the 900,000 escapement goal at only 700,000 fish

Due to the poor expected run of Skeena sockeye a conservative management approach was adopted for Weeks 28, 29, and 30. In 1999 there were three 10-hour openings prior to Statistical Week 31 (Table 1) – one on July 5 (Week 28), one on July 11 (Week 29), and one on July 18 (Week 30). During these three openings, 29, 19, and 18 boats harvested a total of 7,664 sockeye, 71,983 pink, 33,642 chum, and 3,559 coho salmon (Table 1). Catch rates and catches of pink and sockeye salmon were below 1985-1998 averages. The low catch rate on sockeye salmon was consistent with other fishery indicators in the northern boundary area that the Skeena sockeye run was relatively poor. The 30 hours that District 104 was opened in these early weeks were much less than that fished in Districts 101 and 102 which had five 15-hour and one 39-hour openings pre-Week 31. These shortened openings in District 104 combined with ample early-season fishing opportunities elsewhere in the region effectively limited effort in the pre-Week 31 openings.

The average number of hours, boats, days, and boat-days fished pre-Week 31 in years 1985 to 1999 is down 45 to 71% compared to the 1980-1984 period (Table 2). The sockeye harvest is also down 21% despite a 168% increase in the average sockeye catch-per-boat-day since 1984. However, the sockeye catch rate had dropped back to pre-1988 levels in 1998 and 1999.

After Week-30, District 104 was opened the same dates and hours as the purse seine openings in Districts 101, 102, and 103; openings were on a two-day-on and two-day-off schedule from July 25 (Week 31) to August 27 (Week 35). From July 25 through August 3 catches of all species and fishing effort was well below historical averages. In fact, only four boats participated in the July 29-30 opening. Through the openings in early August, the pink salmon harvest in District 104 was well below average as were the catches throughout most of southern Southeast Alaska. In contrast, catches in northern Southeast

Alaska were at record or near record levels. An all-time record pink harvest in the northern Southeast Alaska kept most of the purse seine fleet in those districts through mid-August.

Starting with the 39-hour opening on August 6-7, pink salmon catches increased dramatically in the district and continued at high levels through the remainder of the season. Record level catches of pink salmon also occurred from August 6 through the end of the pink salmon fishing season throughout most of the Southeast region even though the processors limited seine vessels to 30,000 - 70,000 pounds of pink salmon per opening. While catches from inside districts, especially in northern Southeast Alaska were at record levels, overall pink catches in District 104, while at high levels, were below long term averages. Catches of sockeye, coho, and chum salmon were also below long-term averages in the district. Effort levels remained low throughout the year in District 104, in part accounting for the below average harvest. The last opening of the season in District 104, and other Southeast purse seine areas, extended seven days from August 30 to September 5. This continuous opening was allowed due to the fact that most of the major companies had closed for the season and effort levels were at minimal levels.

For the season, the District 104 purse seine fishery harvested 11,985 thousand pink, 365 thousand chum, 165 thousand sockeye, 68 thousand coho, and 3 thousand chinook salmon.

Table 1. Catch and effort in the Alaska District 104 purse seine fishery by opening, 1999.

Week/ Opening	Start Date	Chinook	Sockeye	Coho	Pink	Chum	Boats	Hours
28	5-Jul	0	1,660	1,094	9,710	10,707	29	10
29	11-Jul	0	2,583	1,431	27,315	12,294	19	10
30	18-Jul	0	3,421	1,034	34,958	10,641	18	10
31	25-Jul	0	3,265	2,868	52,953	9,188	14	39
31B	29-Jul	0	2,608	967	50,193	4,669	4	39
32	2-Aug	0	14,812	5,628	314,998	16,809	22	39
32B	6-Aug	1,351	42,622	12,626	1,935,334	83,101	69	39
33	10-Aug	766	34,494	11,416	2,897,470	67,451	102	39
33B	14-Aug	228	22,306	7,728	2,069,800	58,259	95	39
34	18-Aug	309	16,869	8,010	1,820,034	32,335	71	39
35	22-Aug	168	10,156	5,346	1,138,179	23,672	45	39
35B	26-Aug	113	6,966	4,981	1,047,388	20,642	52	39
36	30-Aug	23	3,095	5,319	586,238	15,278	34	150
Total Weeks 28-30		0	7,664	3,559	71,983	33,642	66	30
Total Weeks 31-36		2,958	157,193	64,889	11,912,587	331,404	508	501
Total Season		2,958	164,857	68,448	11,984,570	365,046	574	531

Table 2. Fishing opportunity, effort, and sockeye harvests prior to Week 31 in the District 104 purse seine fishery, 1980 to 1999.

Year	Hours Fished	Boats Fished	Fraction Days Fished (1d=15hr)	Boat-Days Fished (Fraction Boats and Fraction Days)	Sockeye Harvest	Sockeye Catch/ Boat-Day (Cum. Wks. 28-30)
1980	207	195	9.750	1,897	266,198	415
1981	132	119	6.625	787	185,188	707
1982	117	172	6.000	1,034	212,851	636
1983	108	148	6.000	889	168,806	606
1984	108	73	7.000	513	103,319	793
1985	84	76	5.000	378	100,590	750
1986	108	116	6.000	694	91,320	406
1987	75	63	5.000	317	72,385	641
1988	108	112	6.000	673	248,759	1,051
1989	84	74	5.000	368	157,034	1,371
1990	42	95	3.250	307	169,943	2,467
1991	41	60	3.209	193	98,583	2,045
1992	29	69	2.330	162	79,643	1,705
1993	45	91	3.376	307	163,189	1,564
1994	55	38	4.542	174	158,524	2,345
1995	58	47	4.292	202	71,376	1,708
1996	31	48	2.793	133	215,144	3,833
1997	56	87	3.733	399	572,942	4,304
1998	32	42	2.130	89	17,394	588
1999	30	22	2.000	44	7,664	575
Ave. 80-84	134	141	7.075	1,024	187,272	631
Ave. 85-99	59	69	4.000	296	148,299	1,690
% Change	-56%	-51%	-45%	-71%	-21%	168%

District 101 Drift Gillnet Fishery

The June 30, 1999 U.S.-Canada agreement relating to the Pacific Salmon Treaty calls for abundance based management of the District 101 (Tree Point) drift gillnet fishery. The agreement specifies a harvest of 13.8 percent of the AAH of the Nass sockeye run. For the 1999 season, DFO had forecasted a total run of 750,000 Nass River sockeye salmon. The AAH is calculated as the total run of Nass sockeye salmon minus either the escapement requirement of 200 thousand or the actual inriver escapement, whichever is less.

The District 101 drift gillnet fishery opens by regulation on the third Sunday in June. During the early weeks of the fishery, management is based on the run strength of Alaska wild stock chum and sockeye salmon and on the strength of the Nass River sockeye salmon. Beginning in the third week of July, when pink salmon stocks begin to enter the fishery in large numbers, management emphasis shifts by regulation to that species. By regulation, the District 101 Pink Salmon Management Plan sets gillnet fishing time in this district in relation to the District 101 purse seine fishing time when both fleets are concurrently harvesting the same pink salmon stocks.

In 1999, the District 101 gillnet fishery was opened for an initial 4-day fishing week beginning June 20 (Week 26) and then three weeks of 3-day fishing weeks. Sockeye harvests during these openings were close to the historical average. The cumulative sockeye harvest prior to the District 1 Pink Salmon Management Plan was 121,300 fish, or 76% of the season's total sockeye harvest. Chum harvests were generally below average necessitating the reduction to three-day fishing weeks in Weeks 28, 29, and 30. Coho harvest was well above the long-term average, especially in the early portion of the fishery where catches were two to three times the long term average.

The fishery was managed according to the Pink Salmon Management Plan from Week 31 through Week 36. Based on the strong return of pink salmon to District 101, 5-day openings in Weeks 31-36 were allowed. During this time, harvests of pink, chum, and coho salmon were well above Treaty averages and sockeye harvest and effort were below average.

Starting on September 5 (Week 37) and continuing through the close of the fishery on September 29 (Week 40), the fishery was managed on the strength of the fall chum and coho returns. Chum catches were below average but coho catches were well above average and remained strong later into September than in previous years. Three-day fishing periods were allowed in each of these four weeks. Effort declined from 43 boats in Week 37 to 21 boats in Week 40.

A total of 160,028 sockeye salmon were harvested in the District 101 drift gillnet fishery in 1999 (Table 3). The sockeye harvest and number of boat-hours and boats fished was below the 1985-1998 average and the hours fished was above average (Table 4). The final targeted number of Nass sockeye will not be available until catch, escapement, and stock composition estimates are finalized for the year.

Table 3. Weekly catch and effort in the Alaska District 101 commercial drift gillnet fishery, 1999.

Week/Opening	Start Date	Chinook	Sockeye	Coho	Pink	Chum	Boats	Hours
26	20-Jun	510	29,645	870	26	3,418	89	96
27	27-Jun	417	21,218	2,281	1,596	9,343	95	72
28	4-Jul	430	29,602	3,858	17,390	17,669	98	72
29	11-Jul	152	18,013	2,795	38,831	21,325	97	72
30	18-Jul	191	22,975	5,195	120,903	31,036	89	120
31	25-Jul	65	16,888	2,492	64,422	21,403	81	120
32	1-Aug	32	10,039	3,461	62,503	13,097	75	120
33	8-Aug	28	5,489	4,226	80,467	13,624	70	120
34	15-Aug	7	2,766	3,783	75,586	11,292	60	120
35	22-Aug	7	1,633	5,080	64,478	13,046	50	120
36	29-Aug	4	1,316	6,286	51,773	11,795	51	120
37	5-Sep	1	227	5,059	18,800	3,991	43	72
38	12-Sep	0	190	7,793	11,121	4,342	37	72
39	19-Sep	0	25	7,791	3,431	2,594	32	72
40	26-Sep	0	2	3,556	118	820	21	72
Total		1,844	160,028	64,526	611,445	178,795	988	1,440

Table 4. Annual sockeye harvest in the Alaska District 101 drift gillnet fishery, 1985 to 1999, and comparison of sockeye harvest and effort (number of boats, hours, and boat-hours fished) between Statistical Weeks 26 and 35 when sockeye salmon are most abundant in this district.

Year	Annual Sockeye Harvest	Catch and Effort Between Weeks 26 and 35:			
		Sockeye Harvest	Total Boats	Total Hours	Total Boat-Hours
1985	172,863	159,021	1,031	1,032	106,135
1986	145,657	143,286	1,159	960	109,494
1987	107,595	106,638	904	615	64,107
1988	116,115	115,888	1,183	756	92,998
1989	144,936	130,024	1,147	1,023	117,469
1990	85,691	78,056	876	840	70,375
1991	131,492	123,458	802	984	79,992
1992	244,649	243,878	874	1,080	94,161
1993	394,098	390,299	1,000	1,032	102,814
1994	100,377	98,725	792	984	74,483
1995	164,294	151,131	823	1,008	82,512
1996	212,403	175,569	797	1,104	86,108
1997	169,474	152,662	802	1,008	81,672
1998	160,506	159,307	853	1,044	87,358
Average 1985-1998:	167,868	159,139	932	962	89,263
1999	160,028	158,268	804	1,032	80,424

Escapements

Pink salmon escapement indices were well above the 1990-1998 average in most stock groups in Districts 101-104. Escapement indices for Hetta, Moira Sound, and Kasaan stock groups were particularly strong. Escapement indices to all 16 stock groups in Districts 105-108 were also very strong - counts were the highest since data collection began in 1960 at Affleck Canal, Burnett, Ratz Harbor, Shipley Bay, Totem Bay, and Whale Pass. When summed across Districts 101-108, escapement indices totaled 14.7 million and exceeded the 6.0 – 9.0 million goal range by 5.7 million.

Programs to estimate escapements of sockeye salmon were only in place for three systems in southern Southeast Alaska in 1999, Hugh Smith, McDonald, and Salmon (Karta) Lakes. The sockeye escapement to Hugh Smith Lake was 3,174 based on weir counts. The escapement of sockeye salmon into McDonald Lake was estimated to be 89,548 based on expanded foot surveys. Approximately 35,224 McDonald Lake sockeye were harvested in a directed seine fishery in Yes Bay with a total commercial harvest estimated at 78,359 sockeye. Salmon Lake escapement was estimated at 18,380 based on expanded foot surveys.

Escapements of summer and fall run chum salmon were generally well distributed throughout southern Southeast Alaska. Wild stock chum escapement counts were the highest on record in some District 102, 103, and 105 streams. The District 107 harvest levels were the highest on record partially due to returns of hatchery chum salmon. However, District 107 wild chum escapements were also strong. The escapement of chum salmon into Fish Creek at the head of Portland Canal was estimated to be 5,350 based on expanded foot survey counts.

Helicopter and foot surveys of coho salmon indicated that escapements were above average for most systems throughout southern Southeast Alaska. The Ketchikan area coho escapement index of 9,391 was 21% above the 1987-1998 average of 7,732. Survey conditions were difficult throughout most of the fall, but counts were successfully made under satisfactory conditions at near-peak timing on all 15 surveyed streams in the index. The Hugh Smith Lake weir count of 1,246 adults was close to the 1982-1998 average escapement of 1,232 spawners and well above the goal range of 500-1,100.

Transboundary Area Fisheries

Stikine River Area Fisheries

The 1999 harvest in the District 106 commercial gillnet fishery included 518 chinook, 104,878 sockeye, 203,262 coho, 490,716 pink, and 448,367 chum salmon (Table 5). District 106 catches of chinook and sockeye salmon were below the 1989-1998 averages while the catches of coho, pink and chum salmon were above the average. The chum catch was the largest, the coho catch the seventh largest, and the pink catch the ninth highest since 1960. Although this year's sockeye catch was below the previous 10-yr average seven of the largest sockeye catches since statehood have occurred during the past 10 years. An estimated 41.6% of the coho catch was of Alaskan hatchery origin. The U.S./Canada joint Tahltan and Tuya fry planting project contributed an estimated 7,607 fish to the District 106 sockeye catch.

Table 5. Weekly salmon catch in the Alaskan District 106 commercial drift gillnet fisheries, 1999. Catches do not include Blind Slough terminal area harvests.

Week	Start Date	Catch					Effort		
		Chinook	Sockeye	Coho	Pink	Chum	Permits	Days	Permit Days
26	20-Jun	289	7,472	3,401	2,908	2,097	49	3	147
27	27-Jun	56	9,822	2,991	6,413	5,151	88	3	264
28	4-Jul	48	8,812	4,722	17,712	16,677	93	2	186
29	11-Jul	29	11,176	5,616	16,307	41,279	100	2	200
30	18-Jul	42	24,624	10,547	48,592	124,748	125	3	375
31	25-Jul	13	18,690	12,674	28,989	77,273	151	3	453
32	1-Aug	7	11,109	7,659	39,190	39,118	132	3	396
33	8-Aug	7	7,164	11,523	52,486	22,284	107	4	428
34	15-Aug	2	3,619	13,519	100,505	21,718	95	4	380
35	22-Aug	4	1,462	10,749	78,833	16,718	98	4	392
36	29-Aug	1	584	19,200	59,469	27,124	113	4	452
37	5-Sep	1	191	24,104	20,897	27,054	129	3	387
38	12-Sep	1	137	34,655	16,338	18,926	131	3	393
39	19-Sep	4	14	18,529	1,824	5,439	94	3	282
40	26-Sep	7	1	9,596	249	1,643	49	2	98
41	3-Oct	2	0	9,852	4	888	30	2	60
42	10-Oct	5	1	3,925	0	230	25	2	50
Total		518	104,878	203,262	490,716	448,367		50	4,943

In the District 108 fishery, 1,049 chinook, 36,584 sockeye, 28,437 coho, 48,550 pink, and 117,196 chum salmon were harvested (Table 6). District 108 chinook and sockeye catches were below the 1989-1998 average while the catches of coho, pink and chum salmon were all above the 1989-1998 average with the chum catch being the highest on record. An estimated 22.7% of the coho catch was of Alaskan hatchery origin. The U.S./Canada joint Tahltan and Tuya Lake fry planting project contributed an estimated 8,483 sockeye salmon to the District 108 catch.

Table 6. Weekly salmon catch and effort in the Alaskan District 108 commercial drift gillnet fishery, 1999. Catches do not include Ohmer Creek terminal area harvests. The permit days are not adjusted for boats which did not fish the entire opening.

Week	Start Date	Catch					Effort		
		Chinook	Sockeye	Coho	Pink	Chum	Permits	Days	Permit Days
26	20-Jun	393	2,623	133	362	179	26	3	78
27	27-Jun	422	11,622	800	761	1,959	96	3	288
28	4-Jul	123	6,609	775	2,463	3,821	64	2	128
29	11-Jul	45	4,078	623	2,018	7,180	55	2	110
30	18-Jul	32	6,775	2,417	11,318	37,164	104	5	520
31	25-Jul	23	3,281	1,659	6,817	17,555	72	5	360
32	1-Aug	2	775	309	3,540	2,600	14	3	42
33	8-Aug	1	307	1,226	2,268	19,724	23	4	92
34	15-Aug	1	160	1,509	4,508	18,746	30	4	120
35	22-Aug	4	225	3,047	9,986	3,428	33	4	132
36	29-Aug	2	55	2,431	2,845	974	22	4	88
37	5-Sep	0	22	3,991	627	2,496	23	3	69
38	12-Sep	0	11	3,729	1,012	813	23	3	69
39	19-Sep	0	5	3,203	18	344	23	3	69
40	26-Sep	1	0	681	7	89	6	2	12
41	3-Oct	0	0	1,457	0	94	6	2	12
42	10-Oct	0	0	447	0	30	9	2	18
Total		1,049	36,548	28,437	48,550	117,196		54	2,207

Harvest sharing of Stikine sockeye stocks is based on inseason abundance forecasts produced by the Stikine Management Model (SMM) (Table 7). The marine and inriver catches of planted Tuya fish were estimated from analysis of otoliths for thermal marks. Egg diameter analysis of inriver catches was used to estimate the relative abundances of Tahltan and Mainstem fish to Tuya fish in the Stikine River. The ratios of thermally marked Tuya fish to Tahltan and Mainstem fish inriver were applied to the marine catches of Tuya fish to estimate the harvests of Tahltan and Mainstem Stikine sockeye stocks. Based on these analyses and ratios, the Sumner Strait fishery (Subdistricts 106-41 & 42) harvested 21,959 Stikine sockeye salmon, 29.9% of the total sockeye harvest in that subdistrict. The Clarence Strait fishery (Subdistrict 106-30) took 1,531 Stikine fish, 4.8% of the catch in that subdistrict and the District 108 fishery harvested 17,906 Stikine fish, 48.9% of the District 108 catch. An estimated 41,394 Stikine sockeye salmon were harvested in commercial gillnet fisheries from both districts, representing 29.3% of the total sockeye catch. Of these Stikine sockeye salmon, an estimated 16,090 fish were produced by the joint U.S./Canada fry planting project on the Stikine River. Preliminary postseason run reconstruction estimates (Table 8) differ from the inseason management model estimates.

Table 7. Weekly forecasts of run size and total allowable catch for Stikine River sockeye salmon as determined inseason by the Stikine Management Model, 1999.

Stat. Week	Start Date	Forecasts Run Size[a]	TAC	TAC		Cumulative Catch	
				U.S.	Canada	U.S.	Canada[b]
Model Runs Generated by the U.S.							
26	21-Jun	126,000	61,125	30,563	30,563	4,600	28
27	28-Jun	126,000	61,125	30,563	30,563	19,990	1,126
28	5-Jul	75,890	14,457	7,228	7,228	26,582	6,268
29	12-Jul	130,958	64,089	32,045	32,045	34,000	15,268
30	19-Jul	181,195	108,288	54,144	54,144	39,694	25,014
31	26-Jul	224,623	146,702	73,351	73,351	46,687	30,662
32	2-Aug	223,886	146,615	73,307	73,307	46,423	32,854
33	9-Aug	215,050	139,316	69,658	69,658	46,605	32,936
34	16-Aug	205,885	130,422	65,211	65,211	46,605	32,936

[a] U.S. forecast were as follows: the preseason forecast was used for weeks 25 and 26; the inriver test fishery CPUE data for week 27, and the forecast based on inriver commercial fishery CPUE was used for the remainder of the sockeye season. (Canada independently generates forecasts that may use different criteria in some weeks.)

[b] Cumulative catch for Canada does not include approximately 5,500 fish in upper river fisheries – data not available inseason.

The estimated Stikine sockeye run was 123,454 fish (Table 8); the estimated spawning escapements of 7,452 Tahltan and 11,226 Mainstem fish were below the respective escapement goals.

Table 8. Preliminary run reconstruction for Stikine sockeye salmon, 1999.

	Tahltan	Tuya	Mainstem	Total
Escapement	10,748	20,336	11,226	42,310
Broodstock	2,870			
ESSR	0	3,509		
Otoliths	426			
Spawning	7,452	16,827	11,226	35,505
Canadian Harvest				
Indian Food	3,037	1,628	209	4,874
Upper Commercial	431	189	5	625
Lower Commercial	9,393	17,489	5,674	32,556
Total	12,861	19,306	5888	38,055
Test Fishery Catch	544	292	395	1,231
Inriver Run	24,153	43,442	17,510	85,105
U.S. Harvest				
106-41&42	3,473	6,474	3,919	13,866
106-30	425	846	2,734	3,243
108	3,886	7,608	5,843	17,337
Total	7,784	14,928	12,497	35,208
Test Fishery Catch	1,589	1,307	245	3,141
Total Run	33,526	59,677	3,0251	123,454
Escapement Goal	24,000	42,721	30,000	9,6721
TAC	9,526	16,956	0	26,482
Canada TAC	4,763	8,478	0	13,241
Actual Catch	12,862	19,305	5,888	38,055
% of TAC	2.700	2.277		2.874
U.S. TAC	4,763	8,478	0	13,241
Actual Catch	7,784	14,928	12,497	35,208
% of TAC	1.634	1.76		2.659

The postseason estimates are likely to change when stock identification analyses are completed.

Taku River Area Fisheries

The 1999 commercial salmon harvests in the District 111 fishery totaled 1,783 chinook, 79,190 sockeye, 17,176 coho, 59,316 pink, and 429,359 chum salmon (Table 9).

Catches of chinook, sockeye, coho, and pink salmon were below average, but the catch of chum salmon was a record. Enhanced stocks contributed significantly to the harvests of chums and to the other species as well. The chinook salmon harvest of 1,783 fish was 53% of the 1989-1998 average. Alaskan hatchery fish contributed approximately 28% of the harvest or 500 fish as estimated by coded wire tag (CWT) analysis.

The sockeye salmon harvest of 79,190 fish was 66% of the 1989-1998 average catch of 118,984 fish. Estimated contributions of sockeye salmon from joint U.S./Canada Taku River fry planting programs totaled 174 Trapper Lake and 349 Tatsamenie Lake fish. Additionally, an estimated 9,900 domestic U.S. hatchery sockeye salmon were harvested in the Taku Inlet and Stephens Passage fisheries. The season catch was composed of the highest percentage (28.6%) of age-1.2 sockeye salmon since data collecting began in 1982. The high incidence of the younger, smaller fish, which are not as susceptible to capture in gillnets as opposed to older, larger fish, is believed to have lowered the harvest rate for sockeye salmon in the fishery. The percentage of the harvest that occurred in Taku Inlet (Subdistrict 111-32) was 87% of the total catch, higher than the 1988-1997 average of 83%. This was most likely a reflection of increased fishing effort by fishermen in outer portions of Taku Inlet, who were making large catches of summer chum salmon. The coho catch of 17,193 fish was 21% of the 1989-1998 average. Alaskan hatchery coho salmon contributed 1,254 fish or 7% of the District 111 harvest, down significantly from previous years, although returns to local Alaska hatcheries were good to excellent. The catch of 429,359 chum salmon was composed almost entirely (99%) of summer chum salmon. The summer chum run is considered to last through mid-August (statistical week 33) and is composed of domestic hatchery and some wild stocks but quantitative contribution estimates are not available. The catch of 4,785 fall chum salmon (i.e., chum salmon caught after statistical week 33) was 31% of the 1989-1998 average. Most of these chum salmon are of wild origin. The District 111 pink salmon harvest of 59,316 fish was 42% of the 1989 to 1998 average. Fishermen were reportedly not keeping pinks because of low prices. Runs of pink salmon to all streams in the district, including the Taku River, were very good; marine survivals for the 1997 brood year of pink salmon in Southeast Alaska were extraordinary. Approximately 74% of the District 111 pink catch was made in Taku Inlet, followed by 26% in Stephens Passage (Subdistricts 111-31 and 111-20), and none inside Port Snettisham.

Table 9. Weekly catch and effort in the Alaskan District 111 commercial drift gillnet fishery, 1999.

Week	Start Date	Catch					Effort		
		Chinook	Sockeye	Coho	Pink	Chum	Boats	Days Open	Boat Days
26	20-Jun	865	6,612	4	1	1,732	62	3	186
27	27-Jun	300	7,655	7	51	11,230	66	3	198
28	4-Jul	315	11,237	134	2,692	93,466	77	5	385
29	11-Jul	123	18,027	281	6,144	128,625	90	5	450
30	18-Jul	77	10,302	1,204	8,481	101,157	101	4	404
31	25-Jul	31	11,313	1,071	12,222	46,465	70	5	350
32	1-Aug	49	8,507	2,386	18,037	30,909	70	5	350
33	8-Aug	10	1,995	1,415	8,481	10,990	47	3	141
34	15-Aug	4	699	707	1,310	2,192	21	3	63
35	22-Aug	0	342	633	1,589	985	16	2	32
36	29-Aug	1	2,314	1,700	308	594	22	3	66
37	5-Sep	0	126	2,588	0	620	24	2	48
38	12-Sep	1	54	1,217	0	178	18	2	36
39	19-Sep	5	6	1,670	0	138	13	4	52
40	26-Sep	2	1	1,753	0	76	13	4	52
41	3-Oct	0	0	406	0	2	8	3	24
Total		1,783	79,190	17,176	59,316	429,359		56	2,837

Several other fisheries in the Juneau area harvested transboundary Taku River stocks in 1999. Personal use permits were used to harvest Taku River fish; 96 permits harvested a total of 12 chinook, 869 sockeye, 23 coho, 75 pink, and 2 chum salmon. The spring Juneau-area sport fishery harvested an estimated 2,931 large chinook (28 inches or longer) and 102 small chinook salmon. Of the large fish, 2,161 (74%) were wild mature, 46 (2%) were wild immature and 724 (25%) were hatchery fish (CWT estimate). A number of stocks are thought to contribute to the sport fishery, including those from the Taku, Chilkat, and King Salmon rivers, and local hatchery stocks, but the major contributor of mature fish is believed to be the Taku River. The July Hawk Inlet shoreline purse seine fishery north of Point Marsden in Chatham Strait was opened for two days this year due to strong returns of early run pink salmon to the Juneau area. The Hawk Inlet shoreline fishery is located along the migration corridor for Taku River stocks, and catches in the July fishery totaled 597,700 pink, 46,400 chum, and 5,900 sockeye salmon, but no quantitative assessments are done on those catches specifically for transboundary Taku River stocks.

The total Taku River sockeye run was an estimated 178,353 fish, which was 76% of the 1989-1998 average run size of 235,462 fish. Based on the escapement goal midpoint of 75,000 fish, the TAC was 103,353 sockeye salmon of which the U.S. harvested 55%. The estimated escapement of 99,238 sockeye salmon in 1999 was above the escapement goal range. The average historical weekly proportions of Taku River sockeye salmon in the District 111 catches were used to make the preliminary estimate of U.S. catch of Taku origin fish for the preliminary run reconstruction (Table 10).

Table 10. Preliminary Taku sockeye salmon run reconstruction, 1999. Estimates do not include spawning escapements below the U.S./Canada border.

	Taku	Snettisham Stocks
Escapement	99,238	Not Available
Canadian Harvest		
Commercial		
Wild	20,508	
Planted	291	
Food Fishery	382	
Total	21,181	
% Harvest	26.8%	
Test Fishery Catch	44	
Above Border Run	120,463	
U.S. Harvest		
District 111		
Wild	55,795	12,900
Enhanced	595	9,900
Personal Use	1,500	
Total	57,890	
% Harvest	73.2%	
Total Run	178,353	
Taku Harvest Plan	Minimum	Maximum
Escapement Goal	71,000	80,000
TAC	107,353	98,363
Canadian portion	19.7%	21.5%
U.S. Portion	53.9%	58.9%

Alsek River Area Fisheries

Although catch sharing of Alsek salmon stocks between Canada and the U.S. has not been specified, Annex IV of the Pacific Salmon Treaty does call for a cooperative attempt to rebuild depressed chinook and early run sockeye stocks.

Preseason expectations were for an above average run of early sockeye salmon, an average overall sockeye run and a below average run of chinook salmon. These expectations were based on parent-year escapements to the Klukshu River. The Alsek River was opened to commercial fishing during statistical week 24, the first Monday in June (June 7). The initial opening was limited to 24 hours in order to evaluate chinook and sockeye run strengths. Fishery performance indicated that the sockeye harvest was below expected levels and fishing time was not extended. The CPUE was below average during the second week of the season and fishing time was again limited to 24 hours. Fishing time remained at 24 hours during the third week (statistical week 27; June 27 - July 3) of the season because CPUE remained below average. Fishing time was increased to 72 hours for statistical weeks 28, 48 hours for week 29, and 24 hours for week 30 through 32. Due to below average sockeye escapement at the Klukshu weir fishing periods were limited to 48 hours for weeks 34 and 35 even though CPUE was well above average for those weeks. The fishery targeted on coho stocks after late August. Escapement of coho at the Klukshu weir was well above average early in the season and fishing periods ranged from 2 to 4 days during weeks 35 through 40.

The Dry Bay commercial set gillnet fishery harvested 511 chinook, 11,441 sockeye, 5,660 coho, and 112 chum salmon (Table 11). The chinook harvest was about 16% above the 1989-1998 average, the sockeye harvest was 58% of average, and the coho harvest was 98% of average. The number of fishing days was 37. No fishing occurred after week 40. The majority of fishing time (28 days) occurred late in the season (late August through early October) after the sockeye run had largely passed through the fishery. The total effort expended in the fishery was 325 boat-days, 67% of the 1989-1998 average.

The Klukshu sockeye escapement was the lowest on record with 371 early fish, less than 10% of average and 5,010 late migrants, 63% less than average. The sockeye migration had a late timing in 1999 and it is possible that some fish remained below the weir site when the enumeration program was terminated for the season.

Table 11. Weekly catch and effort in the U.S. commercial fishery in the Alsek River, 1999.

Week	Start Date	Catch					Effort		
		Chinook	Sockeye	Coho	Pink	Chum	Permits	Days Open	Permit Days
24	6-Jun	161	358	0	0	0	14	1	14
25	13-Jun	168	291	0	0	0	15	1	15
26	20-Jun	130	775	0	0	0	18	1	18
27	27-Jun	44	3,042	0	0	0	16	3	48
28	4-Jul	2	1,093	0	0	0	16	2	32
29	11-Jul	3	701	60	0	0	15	1	15
30	18-Jul	0	877	3	0	0	15	1	15
31	25-Jul	0	629	0	0	1	12	1	12
32	1-Aug	1	561	0	0	0	12	1	12
33	8-Aug	0	1,549	2	0	0	10	2	20
34	15-Aug	0	1,256	51	0	1	7	2	14
35	22-Aug	1	199	393	0	2	7	2	14
36	29-Aug	0	54	631	0	4	7	3	21
37	5-Sep	1	38	1,200	0	33	6	4	24
38	12-Sep	0	10	1,697	0	32	5	4	20
39	19-Sep	0	6	848	0	37	5	4	20
40	26-Sep	0	2	775	0	2	4	4	16
Totals		511	11,441	5,660	0	112		37	330

Transboundary River Joint Enhancement Activities

The transport of sockeye fry back to the Canadian lakes took place between May 29 and July 03, 1999. Fry planting was slightly delayed due to the late spring. A total of 12 flights resulted in close to 5 million fry transferred. These fry were produced at Snettisham Hatchery from a collection of 6.4 million eggs taken at Tatsamenie and Tahltan Lakes in 1998. There was an overall survival of 78.3% during the incubation period (Table 12). This is slightly better than the five-year average of 73.6%. However there were fewer number of planted fry than in past years due to the smaller egg take in Tahltan Lake (4.0 million) which resulted from low escapement, and a lower egg-take goal for Tatsamenie lake (2.5 million). Thermal marking took place before the fish hatched, and all release groups were successfully marked.

Table 12. Releases and survivals of 1998 brood sockeye salmon outplanted into Stikine and Taku systems in May – July, 1999.

Brood Stock	System Stocked	# of Trips	# of Fry Released	Green to Eye % survival	Green to Release % Survival
Tahltan L.	Tahltan L. (Stikine)	4	1,663,115	91.1%	83.6%
Tahltan L.	Tuya L. (Stikine)	4	1,603,441	91.7%	77.9%
Tatsamenie L.	Upper Tats.L. (Taku)	4	1,631,932	89.7%	73.3%
	Ave/Totals	12	4,898,488	90.8%	78.3%

In Tatsamenie Lake, two different release treatments were used; one group of fry were released nearshore and the second group of fry were held in net pens for short-tem rearing to determine if a larger size at release would improve survival. The two groups were approximately equal in number and differentially marked. In Tahltan Lake, the fry were held for a short period in net pens to observe any transport mortality (there was no significant loss of fry). In Tuya Lake the fry were released directly into the lake.

The 1999 egg take started on August 31 at Tahltan Lake and Sept 25 on Tatsamenie Lake. The 1,442 Tahltan females collected produced 4,181,800 green eggs. In Tatsamenie Lake, only 116 females were collected which yielded 496,337. The reduced egg take from Tatsamenie Lake was primarily a result of low escapement. The egg take at Snettisham Hatchery for the domestic releases in Port Snettisham yielded 6.9 million green eggs.

During the 1999 season, ADFG Thermal mark lab received 15,845 sockeye otoliths collected by ADFG port sampling staff as part of the U.S./Canada Enhancement program. These collections came from commercial and test fisheries in U.S. waters and in Canadian fisheries on the Taku and Stikine Rivers over an 11-week period. In addition, cost recovery and rack samples from Snettisham Hatchery as well as several escapement samples were examined. Combined, the laboratory processed 14,131 of the otoliths received and provided estimates on hatchery contribution for 124 distinct sampling collections. Of these totals, 3,071 otoliths were identified and classified as belonging to one of 28 marking groups. Contribution estimates on the percentage of enhanced fish in the commercial openings were provided to ADF&G and Canadian fisheries managers within 24 to 48 hours after sampling.

Southeast Alaska Chinook Salmon Fishery

All Gear Harvest

The 1999 chinook salmon harvest level was determined first, through the use of a preseason abundance index calculated by the CTC and the corresponding catch identified in Table 1 of Chapter 3 and secondly, through the use of an inseason estimate of abundance as identified by the CTC. The in-season abundance index was used to determine the final corresponding catch in Table 13. The inseason estimate of abundance was 1.16 and corresponded to a catch of 195,600. The preliminary estimate of the 1999 chinook salmon catch by all Southeast Alaska fisheries was 239,100 fish (Table 13). The base catch (total minus the add-on) was 193,400 fish.

Table 13. Chinook all-gear catches in Southeast Alaska, 1987 to 1999, and deviation from the ceiling for years for which there were ceilings. Catches in thousands.

Year	Total Catch	Add-on Catch	Ceiling	Base Catch	Deviation Number	Deviation Percent
1987	281.9	16.7	263	265.2	2.2	0.8%
1988	278.9	23.7	263	255.2	-7.8	-3.0%
1989	291.1	26.7	263	264.4	1.4	0.5%
1990	366.9	53.7	302	313.2	11.2	3.7%
1991	357.0	61.4	273	295.6	22.6	8.3%
1992	260.0	38.3	263	221.7	-41.3	-15.7%
1993	301.9	33.7	263	268.2	5.2	2.0%
1994	261.9	30.9		231.0		
1995	231.1	56.6		174.5		
1996	217.2	68.2		149.0		
1997	339.2	47.6		291.6		
1998	271.0	26.2	260	244.8	-15.2	-5.9%
1999	239.1	45.7	195.6	193.4	-2.2	-1.1%

Troll Fishery

The winter troll fishery harvested 31,000 chinook salmon from October 11, 1998 through April 14, 1999. A total of 2,200 fish were from Alaska hatcheries.

Terminal and experimental fisheries were conducted prior to the July general summer opening. The experimental fisheries are designed to increase the harvest of Alaskan hatchery produced chinook salmon by allowing trolling in small areas of the migratory path close to the hatchery. Terminal fisheries occurred directly in front of hatcheries or at remote release sites.

There is no limit on the number of chinook salmon harvested in the terminal and experimental fisheries. However, the experimental fisheries limit the take of Treaty chinook salmon according to the percentage of the Alaskan hatchery fish taken in the fishery. The catches in 1999 were: 2,400 fish in the terminal fishery and 18,100 fish in the experimental fishery. A total of 54% of the chinook salmon landed in these fisheries were from Alaska hatcheries.

The summer fishery began on July 1 and continued through July 6. The fishery harvested 78,000 chinook salmon of which 3,000 fish were from Alaska hatcheries. A second opening occurred from August 18 through August 22. A total of 16,400 chinook salmon were harvested with 700 fish from Alaska hatcheries. The total summer troll harvest was 145,900 fish.

Net Fisheries

Net fisheries have a guideline harvest of 8,600 chinook salmon, plus 4.3% of the annual harvest ceiling established by the Pacific Salmon Commission (8,410 for a total net harvest of 17,010), plus Alaska hatchery add-on chinook. Catches of chinook salmon in the net fisheries are incidental to the harvest of other species and only constitute a small fraction (<1.0%) of the total net harvest of all species. In 1999, the net fisheries harvested 32,600 chinook salmon of which 20,200 were from Alaska hatcheries.

Recreational Fisheries

The recreational fishery had a harvest of 60,600 chinook salmon of which 16,100 were from Alaska hatcheries.

Southeast Alaska Coho Salmon Fisheries

There is no agreement for management of Southeast Alaska coho salmon harvests, however, Attachment B of the June 30, 1999 U.S.-Canada Agreement Relating to the Pacific Salmon Treaty specifies provisions for inseason conservation and information sharing for northern boundary coho salmon. In 1999, the troll statistic used in the agreement was 69.1 fish per boat-day, the highest recorded catch rate in this fishery. There was no need for any conservation action in the area.

The all-gear catch of coho totaled 3.61 million fish with the majority (2.27 million) taken in the troll fishery (Table 14). Biological escapement goal ranges were exceeded for all of the primary indicator stocks while survey results for additional systems showed strong escapements throughout the region.

Table 14. Coho salmon harvest in Southeast Alaska in 1999 by gear type.

Gear Type	Harvest
Troll	2,272,600
Purse seine	422,900
Drift Gillnet	394,100
Set Gillnet	187,100
Sport	330,000
Total	3,606,700

Southern U.S. Chinook and Coho Fisheries

Ocean Fisheries Off Central Oregon

Fisheries off the central Oregon coast are developed through the Pacific Fishery Management Council process and are constrained by weak stocks of chinook and coho salmon.

The chinook harvest by fisheries off the Oregon coast is primarily comprised of stocks that do not significantly migrate into Canada. The Northern Oregon Coastal (NOC) stock is far north migrating and contributes substantially to southeast Alaskan and Canadian fisheries. This stock group is taken only to a minor degree by Oregon coastal fisheries (probably <5% of total catch). The Mid-Oregon Coastal (MOC) stock aggregate is harvested primarily along the west coast of Vancouver Island. Oregon ocean fisheries are believed to account for a much larger percentage of the total mortality of the stock, but catch contribution data are readily available for only one population of this group in a pre-terminal fishery near the mouth of the Elk River. Both the NOC and MOC stock groups are harvested by recreational fisheries in estuary and freshwater areas as mature fish return to spawn. The 1999 recreational fisheries are currently underway; in-season catch estimates are not made for Oregon estuary and freshwater fisheries. Post-season catch estimates are made pending angler punch card returns.

Coho harvest off the central Oregon coast is comprised mostly of Columbia River and Oregon Coastal stocks and to a lesser degree Washington Coastal and Puget Sound stocks. Coho originating from Canada and Alaska typically represent a very minor component of central Oregon fisheries. With hatchery mass marking of coho salmon and improved abundance of hatchery fish, a small selective recreational coho fishery was adopted for July 1999 off the central Oregon coast. The catch from this fishery was 6,000 marked coho, representing 40% of the 15,000 coho quota.

Columbia River

Commercial and sport fisheries for chinook and coho in 1999 occurred primarily during the fall season (after August 1). Fall season commercial fisheries in the Columbia River consisted of non-Indian fisheries below Bonneville Dam and treaty Indian fisheries above Bonneville Dam and were constrained by concerns for impacts on ESA-listed stocks of chinook and steelhead. The non-Indian commercial fishery had less than one week of directed chinook fishing. Other commercial fisheries in 1999 were directed at coho and other species. Coho fisheries occurred from late September through the end of October directed at surplus hatchery coho. Coho catches in 1999 of about 65,000 were the largest since 1991.

Sport fisheries in the Columbia River in 1999 consisted of a Buoy 10 fishery in the estuary and a mainstem fishery. Although both fisheries were planned to continue throughout the fall season, emergency restrictions were enacted due to ESA constraints. The fisheries were closed early for chinook retention. The Buoy 10 fishery closed to chinook retention on August 30 and the mainstem Columbia River closed to chinook retention on September 13. Both fisheries re-opened for chinook retention on September 29. The total catch in the Buoy 10 fishery was 10,200 chinook and 9,300 coho. Catch in the mainstem Columbia River was 9,100 chinook and 1,200 coho.

Treaty Indian fisheries above Bonneville Dam occurred from late August through early October. A total of about 77,000 fall chinook were harvested along with about 3,500 coho. As in the previous three years, a large portion of the catch was not sold to commercial fish buyers but to the public in an effort to maximize the economic benefits to the treaty fishers.

Ocean Fisheries North of Cape Falcon

The U.S. ocean fisheries operating north of Cape Falcon, OR are typically constrained by coho and chinook ceilings developed through the domestic regulatory process of the Pacific Fisheries Management Council (PFMC).

The preliminary estimates of non-tribal harvest in the 1999 North of Falcon troll fishery are 18,300 chinook and 4,000 coho. This represents 64% of the 28,500 chinook harvest quota and 22% of the 18,000[2] coho harvest quota. The 1999 non-tribal sport preliminary harvest estimates are 10,800 chinook and 47,700 coho, which represent 51% of the 21,400 chinook harvest quota and 43% of the 112,000 coho harvest quota. All PFMC recreational fisheries that allowed coho retention were selective fisheries; only coho with healed adipose fin clips could be retained.

The treaty troll fishery harvested 33,400 coho and 27,400 chinook. The fishery operated from May 1 through September 15 under quotas of 38,400 coho and 30,000 chinook.

Washington Coast

Ocean escapements of south coast chinook stocks – those originating from Willapa Bay and Grays Harbor – were predicted at or below minimum spawning levels in 1999. The majority of hatchery coho returning to Grays Harbor and Willapa Bay in 1999 were marked with the adipose fin clip allowing for the selective harvest of hatchery fish in terminal recreational fisheries. Time and area restrictions were also used to minimize impacts to natural origin coho stocks. Terminal net fisheries, both treaty and non-treaty, were scheduled to target harvestable natural origin and hatchery coho. The preliminary 1999 estimate of total non-Indian net catch for Willapa Bay is 300 chinook and 5,500 coho. There is no tribal catch in Willapa Bay. Combined 1999 treaty and non-treaty net landings in Grays Harbor to date, including the Humptulips and Chehalis rivers, are 1,800 chinook and 11,800 coho. Recreational marine and freshwater chinook and coho catch data are not yet available.

---

[2] The pre-season non-tribal troll coho harvest quota was set at 20,000 and the recreational coho harvest quota at 110,000; an in-season transfer resulted in a non-tribal troll harvest quota of 18,000 and a recreational coho harvest quota of 112,000.

Coho were expected to return in 1999 at levels above the lower end of the escapement range for naturally spawning stocks returning to north coastal rivers except for the Queets. Chinook runs were forecast to come in slightly below recent averages, but still well above spawning goals. Indian and non-Indian fishing was scheduled at levels anticipated to provide adequate escapement. Tribal net fisheries in several systems were required to use large chinook mesh (8 inch plus) during the peak natural origin coho migration period to reduce the catch of coho. Actual returns of naturally spawning coho in 1999 appear stronger than anticipated, based on catch to date.

The North Coastal River Net harvest (all by tribal fisheries) includes catch for the Waatch, Sooes, Quillayute, Hoh, Queets, Quinault, Moclips, and Copalis rivers. The 1999 commercial net fisheries in north coastal rivers have harvested an estimated 7,200 chinook and 47,200 coho to date.

Puget Sound

Puget Sound marine fisheries of interest to the Pacific Salmon Commission in 1999 were regulated to meet conservation and allocation objectives for chinook, coho, pink, chum and sockeye salmon stocks, per tribal-state agreement. For Puget Sound chinook, listed under the ESA this year, fisheries were regulated to achieve reductions in total exploitation rates for key natural stocks, and additional constraints were adopted in many terminal areas. Release requirements were implemented for chinook and for chum salmon to protect ESA-listed summer chum.

In-season adjustments to fishery plans were implemented where information was available to indicate significant changes in pre-season expected returns to terminal areas, including Fraser Panel regulated fisheries in the Strait of Juan de Fuca and San Juan Islands. Lower than expected returns of Puget Sound coho and chum salmon stocks were detected and scheduled fisheries were modified by agreement between tribal and state managers.

Strait of Juan de Fuca Net Fishery

Incidental catches of chinook and coho salmon were lower than expected in pre-season plans due to reduced fishing levels directed at sockeye and pink salmon. Preliminary estimates of the 1999 catch in Strait of Juan de Fuca tribal net fisheries are 500 chinook and 1,000 coho salmon.

Strait of Juan de Fuca Recreational Fishery

Fishing was closed to chinook salmon retention except the period from February 16 to April 10, and the month of November. Selective fishing for marked hatchery coho was open from August 1 through September 30; only fish with healed adipose fin clips could be retained. No fishing was permitted from boats within three-quarters of a mile from shore to reduce impacts on Puget Sound chinook. Estimated harvest during the August and September fishery was 8,300 coho.

Strait of Juan de Fuca Troll Fishery

The 1999 Strait of Juan de Fuca tribal troll fishery harvested an estimated 200 chinook through November 1. The tribal troll catch estimates from this area do not include tribal catches in Area 4B during the May 1-September 30 PFMC management period, which have been included in the North of Cape Falcon troll summary.

San Juan Islands Net Fisheries

Tribal and non-tribal San Juan Islands net fisheries planned for 1999 were closed for conservation of sockeye and pink salmon stocks.

San Juan Islands Recreational

The southern and southeastern (Rosario Strait) portions of this catch area were closed to protect migrating mature Puget Sound chinook salmon. The remaining area was opened for retention of chinook (one-fish bag limit) from July 1 to September 30. Chinook retention also was allowed in the entire area from February 16 - April 10 and the month of November. No estimate of catch is available at this time.

Puget Sound Marine Net

Preliminary estimates of the 1999 tribal net fishery harvests in Puget Sound marine areas other than 4B, 5, 6, 6A, 7, and 7A are 56,800 chinook and 62,700 coho. The 1999 non-tribal net fishery harvested 9,200 chinook and 10,700 coho.

Puget Sound River Net

Preliminary harvest estimates for tribal river net fisheries in Puget Sound are 18,100 chinook and 27,900 coho in 1999. Coho catches increased slightly from 1998 levels. Chinook harvest levels increased by 63% from 1998 levels. Coho harvest levels showed a very modest increase (4%) from 1998.

Puget Sound Recreational

Puget Sound recreational catch estimates for Areas 8-13 in 1999 are not available at the present time.

Preliminary Review of 1999 Washington Chum Fisheries of Interest to the Pacific Salmon Commission

This summary report provides a preliminary review of the 1999 chum fishing season and is subject to correction and revision as additional information becomes available. Some Washington chum fisheries are still underway, and catch and run size information provided are preliminary data reported through mid-November. This report addresses in detail only those fisheries of concern under the Pacific Salmon Treaty. The mixed-stock fisheries in United States (U.S.) waters that are addressed in the chum annex of the Pacific Salmon Treaty are those in the western Strait of Juan de Fuca (areas 4B,5 and 6C), the San Juan Islands (area 7) and Point Roberts (area 7A). Other chum fisheries in Washington waters are primarily terminal fisheries which harvest runs of local origin.

Mixed Stock Fisheries

Areas 4B, 5, 6C

As in previous years, the chum fishery in areas 4B, 5, 6C was restricted to Treaty Indian gill net gear only. The commercial chum fishery began October 15 and remained open 7 days per week until November 13. No test fisheries for collection of GSI samples were conducted, and no samples for GSI analysis were collected from the commercial catch during 1999.

Incidental summer chum catches in fisheries prior to the fall chum management period totalled only seven fish. Fall chum catches in the Strait of Juan de Fuca commercial fishery were significantly less than expected given the forecasted abundance of Puget Sound and Canadian chum runs. The lower than expected harvests were primarily due to low catch rates and low effort. The commercial harvest recorded from the fall chum management period was 6,950 chum bringing the total chum catch in areas 4B,5,6C, reported through November 18, to 6,959.

Areas 7 and 7A

Preseason forecasts were for significant numbers of harvestable fall chum returning to Puget Sound. In contrast, the preseason forecast for the Canadian chum run returning to Johnstone Strait was for only 2.5 million chum, which is less than the 3.0 million required for any significant commercial fishery. Test fishing in Johnstone Strait in early October indicated a somewhat stronger chum return, but still not sufficient to allow a fishery. At the conclusion of the test fishery in Johnstone Strait the final in-season run size update was 2.7 million chum.

The chum annex provides for a U.S. harvest in areas 7 and 7A of no more than 20,000 chum when the Johnstone Strait run size is less than 3.0 million, and the catch in Johnstone Strait is less than 225,000 chum. Based on updated run sizes that remained below 3.0 million, there was no chum fishing conducted in areas 7 and 7A in 1999. There were also no incidental catches of chum during the sockeye and pink salmon management periods due to a complete closure of fisheries for those species.

Puget Sound Terminal Area Fisheries and Run Strength

Preseason forecasts for chum returns to Puget Sound were for a fall chum run totalling about 1.9 million. Some Puget Sound chum runs have been updated in-season indicating overall returns significantly lower than expected preseason, while others appear to be at or above preseason forecasts. Some Puget Sound chum fisheries are still underway, and additional in-season estimates of abundance may be made in the coming weeks. At this time, it is far too early to assess spawning escapement.

Table 15. Preliminary 1999 chum harvest in selected Puget Sound catch reporting areas.

Week	Areas 4B,5,6C Treaty Indian	Areas 7 & 7A Treaty Indian	Areas 7 & 7A Non-Indian	Areas 7 & 7A Total
Prior to 10/10	7	0	0	0
10/10 - 10/16	1,005	0	0	0
10/17 - 10/23	1,623	0	0	0
10/24 - 10/30	2,998	0	0	0
10/31 - 11/6	743	0	0	0
11/7 - 11/13	581	0	0	0
Season Totals	6,957	0	0	0

U.S. Fraser Sockeye and Pink Fisheries

In June of 1999, U.S. and Canadian Government negotiators concluded a new Agreement that, among other provisions, established new fishing regime arrangements under Annex IV of the Pacific Salmon Treaty. For Fraser River sockeye and pink salmon, 1999 represented the first fishing season under a 12 year agreement that will be in effect through 2010. The management of Fraser River sockeye and pink fisheries, in Panel Area waters, will be carried out by the Pacific Salmon Commission through its Fraser River Panel. The major provisions of the new Agreement that affect the Fraser River sockeye and pink fisheries are as follows:

1) For 1999, the U.S. share of the Total Allowable Catch of Fraser Sockeye was set at 22.4%. The U.S. share will be reduced to 20.4% in 2000, 18.4% in 2001 and 16.5% in 2002. For the remaining term of the agreement, the U.S. share will remain at 16.5%.

2) The agreement provides for a Fraser River Aboriginal Fishery Exemption of 400,000 sockeye annually. In the calculation of TAC, the Exemption is to be allocated to management groups using the average proportional distribution of this harvest for the most recent three cycles unless otherwise agreed.

3) The U.S. harvest of sockeye is to be spread proportionally to the TACs of the management groups unless otherwise agreed.

4) The U.S. TAC of pink salmon shall not exceed 25.7%.

5) Once the Panel has taken control of the Fraser Panel Area, fisheries in the Area are closed unless opened by action of the Panel.

6) The Agreement provides for any harvest underage or overage to be carried forward into the allocation for subsequent fishing seasons.

To review the exact wording for the above provisions and to review other provisions applying to activities of the Fraser Panel and its Technical Committee, please consult the agreement.

Pre-Season Expectations for the 1999 Season

The preseason forecast was for a total return of Fraser River sockeye of 8,248,000 fish. This forecasted return was broken into the major management groups as follows:

Early Stuart	318,000
Early Summer	477,000
Summer	328,000
Late	2,125,000
Total	8,248,000

The Fraser River pink run was forecasted to return at 8,148,000 fish.

The season long diversion rate through Johnstone Strait for the 1999 Fraser River was forecasted to be 16.4% for sockeye and 30% for pink salmon.

Based on the forecast, the agreement provisions for 1999, escapement goals provided by DFO the Panel agreed to adjustments to these goals and anticipated test fishing catches, a sockeye share for the U.S. fisheries of 1,082,000 fish was expected. For pink salmon, the expected U.S. share was 547,000 fish. The U.S. shares were to be divided 50%:50% between Treaty Indian and Non-Indian fishers. The Treaty Indian share of sockeye was to be divided with 20% going to the fishery in the Strait of Juan de Fuca in Areas 4B, 5 and 6C and 80% for the fishery in Areas 6, 7 and 7A. The division of the Non-Indian catch was to be 54% purse seine, 41% gillnet and 5% reef net.

Significant Circumstances Affecting the 1999 Fraser returns and Fisheries

Sockeye Runs Return Well Below Forecasted Levels

As soon as scale samples from early run sockeye became available from test fishing catches, concern was raised for the lower than expected proportion of four year old fish present. This weakness in the return of four year old fish carried through the main summer and late runs of sockeye which are comprised of mainly of this age class. Based on the final in-season estimates provided by the PSC staff on September 20, the summer run return was 1,374,000 compared to the preseason forecast of 5,328,000 and a late run return of 1,594,000 compared to a forecast of 2,125,000. The total sockeye return was 3,584,000 fish compared to the forecasted level of 8,248,000. This is the lowest return on this cycle since 1955 and the smallest of any year since 1980.

The low return of four year old Fraser sockeye was most likely the result of the effects of the 1997 El Nino which was occurring as these fish experienced the early marine portion of their life cycle. Current forecasting methods for Fraser River sockeye do not use marine survival factors. The smolt to adult survival rate for the 1999 return was one of the lowest on record.

Extreme High Water Conditions Cause Large Losses of Early Runs of Sockeye and Delays Migration

The 1999 return of Fraser River sockeye encountered record high levels of water discharge that resulted primarily from a large snowpack in the Fraser drainage. During the migrations of the Early Stuart and Early Summer runs, high water levels created blockages to migration in the Fraser Canyon that prevented the majority of these fish from reaching the spawning grounds. Escapement levels for the many small stocks that make up these run components are well below the escapements for recent cycle years. Preliminary estimates by DFO indicate that only 24,532 Early Stuart sockeye of the 144,200 fish that are estimated to have passed Mission, made it to the spawning grounds. For Early Summer sockeye stocks, only 101,483 fish are estimated to have reached the spawning grounds compared to a Mission count of 375,400 fish.

Summer run sockeye migrating in the Fraser River were delayed by the high flows, but to a lesser extent than the earlier runs. It is not certain at this time if their spawning success was affected by these delays.

An Unexpectedly High Diversion Rates Occurred for Both Sockeye and Pink Salmon

Based on lower than average spring ocean water temperatures off the west coast of Vancouver Island, low diversion rates through Johnstone Strait of 16.4% for sockeye and 30% for pinks was forecasted by DFO. The actual overall diversion rate for all sockeye stocks is estimated at 50%. The pink run diverted at an unprecedented high rate, approximately 84%. There has been no explanation of the reasons for these high diversion rates.

The Majority of the Late Run Sockeye enter the River upon arrival

Approximately two-thirds of the late run sockeye did not delay in the Gulf of Georgia as normal and entered the river several weeks early. They encountered higher river flows than they would normally experience and were exposed to the fresh water environment much longer than normal. A portion of the early migrating late run fish were lost to disease before spawning, probably as a result of their changed migration pattern. No explanation for the early entry of late run sockeye into the river has been identified.

Sockeye Salmon Fishery

Based on the forecast and the provisions of the Agreement, the U.S. share of sockeye was expected to be 1,082,000 fish. The summer and late runs of sockeye were expected to provide almost all of the harvest. The U.S. Treaty Fishery in Juan de Fuca Strait, Areas 4B, 5 and 6C was opened as soon as summer run sockeye became the dominate stock in the area. This small, low impact fishery is normally opened early to ensure that its allocated share can be taken before the run is past. The fishery opened on July 25 and operated for eleven days before closing on August 6 with a total sockeye catch of 19,800 fish.

By August 6, information provided to the Panel by the PSC staff indicated that the summer run sockeye return would be only 1,400,000 fish compared to the forecast of 5,328,000. The Panel adopted this revised summer run size and adopted a provisional late run size of 1,100,000 fish compared to the forecast of 2,125,000 fish. With these revisions, the total sockeye run size was reduced to approximately 3,100,000 fish compared to the pre-season forecast of 8,248,000 fish. This reduction in run size eliminated any U.S. fishing opportunities. On August 6 the Panel announce the closure of all commercial fisheries in Panel Waters until further notice.

On August 31, the Panel updated the late run size from the provisional 1,100,000 fish to 1,400,000 fish on the recommendation of the PSC staff. This increase in run size resulted in a share of 93,000 sockeye for U.S. fisheries. When the 19,800 fish taken by the Treaty fishery in Areas 4B, 5 and 6C was subtracted, a potential harvest of approximately 73,000 fish for U.S. fisheries was identified. The U.S. Section of the Panel proposed a fishery to take the available fish, but the Canadian Section would not support the proposal due to their concern for the uncertain status of the pink return. The U.S. Section of the Panel is treating this uncaught share as an underage for the U.S. as provided for in Paragraph 8 of the Fraser River Sockeye and Pink chapter of Annex IV for the 1999 - 2010 Agreement. The Canadian Section of the Panel has agreed an underage was created but not to the amount of the underage.

No U.S. sockeye directed fisheries were conducted in Areas 6, 7 and 7A in 1999. The only U.S. commercial harvest was the 19,800 fish taken in the Treaty fishery in Areas 4B, 5 and 6C.

Pink Salmon Fishery

The forecasted pink run size of 8,148,000 fish was never adjusted by the Panel in-season because of the lack of commercial fishery data needed to make run size updates. During the early portion of the run, it appeared the return would be well below forecast, but timing of the run was more extended than normal and the Panel did not adjust the run size from the forecasted level. At the forecasted pink run size, a U.S. share of 547,000 fish was available. The highest diversion rate for pink salmon ever observed (believed to be approximately 84%) resulted in low availability of pinks in U.S. Panel Waters. On

September 7, the U.S. Section proposed a fishery for pinks which was not supported by the Canadian Section due to concerns for coho by-catch. There was agreement that this created a situation where the U.S. could not harvest its share of pinks and that an underage had been created and a carry over was warranted.

Escapements

Despite the low sockeye return, the complete closure of most commercial fisheries provided sufficient escapement to the lower river to meet most escapement goals. Also, all gross escapement goals established by Canada were met or exceeded. Unfortunately, the adverse migration conditions that were experienced in the river caused significant mortalities of the Early Stuart and Early Summer sockeye stocks before they reached the spawning grounds. The preliminary spawning ground estimate for summer run sockeye escapement is 1,327,626 fish. This is the largest escapement for these stocks on record. Late run spawning escapement estimates are not available at this time.
Updated spawning ground escapement estimates for all sockeye stocks should be available for the January 2000 Post Season Meeting of the PSC.

Pink salmon escapement levels are determined through a mark and recapture estimate conducted by DFO in the lower Fraser River. Preliminary results for this program should be available by the January Post-Season meeting. If the pink salmon run returned at the forecasted level of 8,148,000 fish, the escapement goal of 6,000,000 fish will be exceeded as no commercial fisheries occurred on pink salmon.

(Source document) *Preliminary 1999 Post-Season Report for United States Fisheries of Relevance to the Pacific Salmon Treaty.* United States Section of the Pacific Salmon Commission December, 1999.

D. 1999 UPDATE REPORTS FOR SALMONID ENHANCEMENT PROGRAMS IN THE UNITED STATES AND CANADA

The Pacific Salmon Treaty between Canada and the United States requires that information be exchanged annually regarding operatings of and plans for existing enhancement projects, plans for new projects, and views concerning the other country's enhancement projects. In 1988, a committee was formed to develop recommendations for the pre- and post-season and enhancement report formats. In summary, the committee proposed that:

- detailed reports on existing enhancement facilities of the type produced in 1987 be prepared every four years;

- the Parties will annually update information on eggs taken, fry or smolt released and adults back to the facility; significant changes in facility mission or production will be highlighted in narratives; and

- the Parties will provide periodic reports through the appropriate panels on new enhancement plans.

1. 1999 Update Report for the Salmonid Enhancement Program in British Columbia

This report had not been received by March 31, 2000.

2. 1999 Annual Report on the Salmonid Enhancement Activities of the United States

This report had not been received by March 31, 2000.

Reports of the Joint Technical Committees

PART V
REPORTS OF THE JOINT TECHNICAL COMMITTEES

Executive summaries of reports submitted to the Commission by the joint technical committees during the period April 1, 1999 to March 31, 2000 are presented in this section. Copies of the complete reports are available from the library of the Pacific Salmon Commission.

A. JOINT CHINOOK TECHNICAL COMMITTEE

Joint Chinook Technical Committee - Maximum Sustained Yield or Biologically Based Escapement Goals for Selected Chinook Salmon Stocks Used by the Pacific Salmon Commission's Chinook Technical Committee for Escapement Assessment. Volume 1. TCCHINOOK (99)-3. December, 1999.

In February of 1998, the United States (U.S.) and Canada exchanged proposals regarding management regimes for chinook salmon. The similarities and differences of the two proposals were discussed in TCCHINOOK (98)-01. In addition to exchanging proposed management regimes, both parties also instructed the Chinook Technical Committee (CTC) to determine Maximum Sustained Yield (MSY) or other biologically based escapement goals for the 46 chinook stocks that the CTC uses to assess fisheries effects upon wild chinook salmon escapements. In TCCHINOOK (98)-01, the CTC identified eight stocks (Situk, Alsek, King Salmon, Unuk, Chickamin, Keta, Blossom, and Andrew Creek) for which there already existed agreed MSY escapement goals.

This report includes a chapter explaining the general methods for stock-recruitment analysis and the resulting MSY or biologically based escapement goals for seven additional escapement assessment stocks: Taku, Stikine, Lewis, Columbia River Summer, Nehalem, Siletz, and Siuslaw.

B. JOINT CHUM TECHNICAL COMMITTEE

No reports were finalized for publication by this Committee during this reporting period.

C. JOINT COHO TECHNICAL COMMITTEE

No reports were finalized for publication by this Committee during this reporting period.

D. NORTHERN BOUNDARY TECHNICAL COMMITTEE

No reports were finalized for publication by this Committee during this reporting period.

E. JOINT TRANSBOUNDARY TECHNICAL COMMITTEE

Joint Transboundary Technical Committee. Salmon Management and Enhancement Plans for the Stikine, Taku and Alsek Rivers, 1998. TCTR (99)-1. August, 1999.

Management of transboundary river salmon to achieve conservation, allocation and enhancement objectives, as stipulated by the Pacific Salmon Treaty, requires a co-operative approach by Canada and the United States. It is important that both Parties have a clear understanding of the objectives and agree upon procedures to be used in managing the fisheries, including the criteria upon which modifications of fishing patterns will be based. This document is intended to facilitate co-operative salmon management and research on transboundary stocks of the Stikine, Taku, and Alsek rivers conducted by the Canadian Department of Fisheries and Oceans (DFO), the Tahltan First Nation (TFN), the Iskut First Nation (IFN), the Taku River Tlingit First Nation (TRTFN), the Alaska Department of Fish and Game (ADF&G), and the National Marine Fisheries Service Auke Bay Laboratory (NMFS-ABL).

The report contains, by river system and species, the 1998 salmon forecasts, spawning escapement goals, a summary of harvest sharing objectives, and an outline of management procedures to be used during the conduct of the 1998 fisheries. With the exception of Stikine sockeye salmon, for which a numerical forecast is required by the Pacific Salmon Treaty and by the Stikine Management Model and Taku River sockeye salmon, forecasts are given qualitatively, with reference to brood year escapement data where available. The report also contains joint enhancement plans for fry plants and egg collections in 1998 and proposed transboundary field projects for the year, identifying agency responsibility and contacts for the various functions within the projects.

Joint Transboundary Technical Committee. Salmon Management and Enhancement Plans for the Stikine, Taku and Alsek Rivers, 1999. TCTR (99)-2. August, 1999.

Management of transboundary river salmon to achieve conservation, allocation and enhancement objectives, as stipulated by the Pacific Salmon Treaty, requires a co-operative approach by Canada and the United States. It is important that both Parties have a clear understanding of the objectives and agree upon procedures to be used in managing the fisheries, including the criteria upon which modifications of fishing patterns will be based. This document is intended to facilitate co-operative salmon management and research on transboundary stocks of the Stikine, Taku, and Alsek rivers conducted by the Canadian Department of Fisheries and Oceans (DFO), the Tahltan First Nation (TFN), the Iskut First Nation (IFN), the Taku River Tlingit First Nation (TRTFN), and the Alaska Department of Fish and Game (ADF&G).

The report contains, by river system and species, the 1999 salmon forecasts, spawning escapement goals, a summary of harvest sharing objectives, and an outline of management procedures to be used during the conduct of the 1999 fisheries. With the exception of Stikine sockeye salmon, for which a numerical forecast is required by the Pacific Salmon Treaty and by the Stikine Management Model and Taku River sockeye salmon, forecasts are given qualitatively, with reference to brood year escapement data where available. The report also contains joint enhancement plans for fry plants and egg collections in 1999 and proposed transboundary field projects for the year, identifying agency responsibility and contacts for the various functions within the projects.

Joint Transboundary Technical Committee. Estimates of Transboundary River Salmon Production, Harvest and Escapement and a Review of Joint Enhancement Activities in 1998. TCTR (00)-1. February 5, 2000.

Estimates of catches and escapements of Pacific salmon returning to the transboundary Stikine, Taku, and Alsek Rivers for 1998 are presented and compared with historical patterns. Relevant information pertaining to the management of appropriate U.S. and Canadian fisheries is presented and the use of in-season management models is discussed. Results from transboundary river sockeye fry planting projects are also reviewed.

Stikine

The 1998 Stikine sockeye run is estimated at 121,448 fish. An estimated 81,085 fish were harvested in various fisheries including test fisheries, 390 fish were taken at the Tahltan Lake weir for otolith samples, 3,099 fish were used for brood stock, 28,344 fish escaped to spawn, and 8,531 fish returned to the Tuya system and were not harvested. The catch and run were both below the 1988-1997 averages and spawning escapements were below goals. The estimated U.S. commercial catch of Stikine sockeye salmon in Districts 106 and 108 was 27,848 fish and the Canadian inriver commercial, aboriginal, and ESSR fishery catches were 38,217, 5,586, and 6,103 fish, respectively. A U.S. test fishery in District 108 harvested 3,141 Stikine sockeye salmon and the Canadian inriver test fishery catch included 190 sockeye salmon. Sockeye salmon originating from outplants into Tahltan and Tuya Lakes contributed an estimated 14,774 (11% of the catch) and 17,656 (40% of the catch) fish to the U.S. and Canadian catches, respectively. The postseason run size estimate of 121,448 Stikine sockeye salmon was below the preseason forecast of 218,500 fish. The Stikine Management Model consistently predicted a run less than the preseason forecast, but did not predict a run as low as the postseason estimate. Weekly in-season model forecasts ranged from 197,000 to 209,000 sockeye salmon; the final in-season model prediction was 208,737 fish (both U.S. and Canada), with a total allowable catch (TAC) of 130,260 fish. Based on the in-season model estimates, both Parties harvested below their 50% target of the TAC (65,130 Stikine fish). However, using the postseason estimate of run size and TAC, both countries exceeded their 50% portion of the TAC; Canada harvested 125% and the U.S. harvested 80% of the TAC. The broodstock collection and otolith sampling removed 3,099 and 390 sockeye salmon, respectively, from the escapement to Tahltan Lake leaving a spawning escapement of 9,169 fish, falling below both the acceptable goal range of 18,000 to 30,000 fish and the warning level of 13,000 fish. The estimated escapement of 19,175 mainstem Stikine sockeye salmon was also below the objective of 20,000 to 40,000 spawners for this stock group.

The chinook catch in Canadian commercial and aboriginal fisheries in the Stikine River was 2,164 large fish and 423 jacks, 95% and 88% of the respective 1988-1997 averages. An additional 25 large and 11 jack chinook salmon were taken in the Canadian inriver test fishery. The U.S. marine chinook catch (all stocks) in the District 106 and 108 mixed stock gillnet fisheries was 978 fish, below the 1988-1997 average catch. No chinook salmon were taken in the U.S. District 108 test fishery. The chinook spawning escapement of 4,873 large adults through the Little Tahltan River weir in 1998 was 92% of the joint U.S./Canada escapement goal of 5,300 fish and 83% of the 1988-1997 average. Surveys of other Stikine tributaries showed below average escapements. The total Stikine spawning escapement estimated from a mark-recapture program was 25,456 fish.

As with chinook salmon, the U.S. marine harvest of Stikine coho salmon is unknown since there is no stock identification program for this species. Coho catches in Districts 106 and 108 were 273,197 and 19,206 fish, respectively, and were above the 1988-1997 averages. Alaskan hatchery fish comprised approximately 36% (104,172 fish) of the coho harvest from the two districts. The Canadian inriver coho catch of 726 fish was 26% of the 1988-1997 average. Aerial surveys of six coho spawning index sites indicated below average spawning escapement.

Taku

The estimated 1998 Taku sockeye run is 145,559 fish, including an estimated catch of 71,106 fish and an above-border-spawning escapement of 74,453 sockeye salmon. The run size and catch were below the respective 1988-1997 averages and the escapement was below average but within the escapement goal range of 71,000 to 80,000 fish. An estimated 49,493 Taku sockeye salmon were harvested in the District 111 commercial fishery, 58% of the 1988-1997 average, and an estimated 2,338 sockeye salmon were harvested in the U.S. inriver personal use fishery. Canadian inriver commercial and aboriginal fishery catches included 19,038 and 237 sockeye salmon, respectively. The commercial catch was 71% of the 1988-1997 average, whereas the aboriginal catch was 17% above average. Since the escapement goal is expressed as a range, the resulting total allowable catch is also expressed as a range. In 1998, Canada harvested an estimated 26% to 29%, and the U.S. took 70% to 79% of the TAC. Sockeye salmon originating from fry plants into Trapper and Tatsamenie Lakes contributed 820 fish to the U.S. commercial catch and 589 fish to the Canadian commercial catch.

The catch of large chinook salmon in the Canadian commercial fishery in the Taku River was 1,107 fish, 67% of the 1988-1997 average; in addition, 227 jack chinook salmon were caught compared to an average of 196 fish. The Canadian aboriginal fishery in the Taku River harvested 60 large chinook salmon. The chinook catch in the District 111 mixed stock gillnet fishery was 794 fish, the lowest on record and 23% of the 1988-1997 average. Approximately 37% of the catch was estimated to be of Alaska hatchery origin. The escapement of 6,295 chinook salmon counted in Taku River index areas was 54% of the 1988-1997 average and 48% of the index escapement goal of 13,200 fish.

The estimated above border run size of Taku River coho salmon in 1998 is 66,472 fish, 87% of the 1988-1997 average. The Canadian inriver commercial catch included 5,090 coho salmon, 92% of the 1988-1997 average. The above-border-spawning escapement is estimated at 61,382 coho salmon, which exceeds the interim escapement goal range of 27,500 to 35,000 fish. The U.S. harvest of 28,713 coho salmon in the District 111 mixed stock fishery was 34% of the 1988-1997 average. Alaskan hatcheries contributed an estimated 21% of the District 111 harvest, or 5,931 fish.

The catch of pink salmon in District 111 was 168,283 fish, 20% above the 1988-1997 average catch of 140,407 fish. Pink salmon were not retained in the Canadian commercial inriver fishery in 1998. The escapement of pink salmon to the Taku River was likely above average as evidenced by the fish wheel catch and release of 23,347 pink salmon, 69% above the 1988-1997 average.

The catch of chum salmon in the District 111 fishery was 296,306 fish, composed of 291,416 summer run fish (prior to mid-August) and 4,695 fall run fish. The catch of summer chum salmon, primarily Alaskan hatchery stocks, was 75% above the 1988-1997 average and was the third highest on record. The Taku River does not have a summer chum run. The catch of fall chum salmon, composed of wild Taku River and Port Snettisham stocks, was 25% of the 1988-1997 average. As with pink salmon, there was non-retention of chum salmon in the Canadian inriver fishery and the reported catch was 2 fish in 1998. Spawning escapement appeared to be poor; the Canyon Island fish wheel catch of 179 chum salmon was 32% of the 1988-1997 average and the second lowest on records dating back to 1984.

Alsek

The Alsek River sockeye harvest of 15,007 fish in the U.S. commercial fishery was 80% of the 1988-1997 average. The Canadian inriver catch of 585 sockeye salmon was the second lowest on record, following 1997 and was 27% of the 1988-1997 average. The aboriginal fishery harvested 567 sockeye salmon, 32% of the 1988-1997 average. The catch of 18 sockeye salmon in the sport fishery was the lowest on record and 5% of the 1988-1997 average. The low catches were the result of extensive closures in the sport and aboriginal fisheries due to conservation concerns. The escapement to the Klukshu River weir of 13,580 fish was 86% of the 1988-1997 average. The Klukshu weir count of 597 early run sockeye (count through August 15) was 16% of the 1988-1997 average, whereas the count of 12,994 late run fish was 98% of average for the same period. Counts in other index areas were less than 20% of average.

The chinook run to the Alsek River seemed below average. The U.S. Dry Bay catch of 550 chinook salmon was 36% above the 1988-1997 average. The combined Canadian sport and aboriginal fishery catch of 329 chinook salmon was 48% of the 1988-1997 average. The 1,364 chinook salmon counted through the Klukshu River weir was the second lowest on record and was 46% of the 1988-1997 average. Of the total count, 1,347 chinook salmon were estimated to have spawned, thus achieving the minimum spawning escapement goal of >1,100 chinook salmon, established by the TTC for 1998. Aerial survey index counts of other spawning systems were below average

The coho run to the Alsek River was about average although current stock assessment programs prevent an accurate comparison with historical runs. The U.S. Dry Bay catch of 4,925 coho salmon was 85% of the 1988-1997 average, while the combined Canadian inriver aboriginal and sport fishery catch of 112 fish was 65% of the 1988-1997 average.

The low catch was due to closures in the fisheries because of sockeye conservation concerns. The operation of the Klukshu weir does not provide a complete enumeration of coho salmon into this system since it is removed before the run is over; however, it does provide a suitable annual index. The count of 1,961 coho salmon was 80% of the 1988-1997 average.

Enhancement

Eggs and milt were collected from the 1998 sockeye escapements at Tahltan and Tatsamenie Lakes. A total of 4.3 million eggs were collected at Tahltan Lake, 72% of the 6.0 million egg-take goal; the goal was not attained due to poor escapement to the lake in 1998. At Tatsamenie Lake, approximately 2.6 million eggs were taken, thus achieving the goal to take between 2.5 and 5.0 million eggs from this system in 1998.

Outplants of 1997 brood-year sockeye fry in June 1998 included 1.9 million fry into Tahltan Lake, 0.4 million fry of Tahltan Lake origin into Tuya Lake, and 3.6 million fry into Tatsamenie Lake. Green-egg to planted-fry survivals were 82%, 91%, and 77% for these outplants, respectively. Survival to emergence was generally at, or below, expected levels, partially due to a loss of approximately 178,577 fry due to Infectious Hematopoietic Necrosis (IHN).

Sampling of outmigrating smolts was conducted at Tahltan, Tuya, and Tatsamenie Lakes, systems that had been stocked with sockeye fry in previous years. Sockeye smolts were captured at all lakes. Total emigration from Tahltan Lake in 1998 was an estimated 540,866 smolts, with an estimated 214,446 smolts from fry plants. The sampling program at Tuya Lake provided age and size composition of the smolts but no estimate of total outmigration. At Tatsamenie Lake, an estimated 2,291,000 smolt out-migrated from the lake; this estimate was derived from mark-recapture data and is the highest on record. The egg incubation and thermal-marking program at Snettisham Hatchery were continued in 1998. Snettisham hatchery is operated by DIPAC (Douglas Island Pink and Chum, Inc.), a private aquaculture organization in Juneau. A co-operative agreement between ADF&G and DIPAC provides for Snettisham to serve the needs of the joint TBR fry planting projects.

Adult sockeye salmon otoliths were processed in-season by the ADF&G otolith lab to estimate the weekly contribution of fish from U.S./Canada fry planting programs to the District 106, 108, and 111 gillnet fisheries and to Canadian commercial fisheries in the Stikine and Taku Rivers.

F. JOINT TECHNICAL COMMITTEE ON DATA SHARING

Joint Technical Committee on Data Sharing. Report on the 1994 Status of the Coastwide Coded Wire Tag Database. TCDS (99)-1. December, 1999.

This report was initially prepared in 1994, although it was unpublished at that time. The Data Sharing Committee took up the report again in September 1997 and it was decided to maintain the report as a status report through 1994.

Coded wire micro-tags were first introduced in the late 1960's as an alternative to fin clipping and various types of external tags. Coastwide use quickly followed and led to the early establishment of large-scale ocean sampling/recovery programs by the five State/Province fisheries agencies (ADF&G, CDFO, WDFW, ODFW, and CDFG). Tagging programs have continued to expand, with over 55 federal, state/province, tribal/aboriginal, and private entities releasing approximately 45 million CWT marked salmonids annually (1994 statistics).

The Pacific Salmon Commission (PSC) coded wire tag (CWT) database contains five types of data files: 1) Release, 2) Recovery, 3) Catch and Sample, 4) Location Codes, and 5) File Description. These five data files are described and the file specifications for Format Version 3.1 are provided. The status of data provided to the database is also given.

The Canadian copy of the coastwide CWT data resides on a VAX computer at DFO's Pacific Biological Station in Nanaimo, B.C. and is called the Mark Recovery Database, it is managed by the Salmon Stock Assessment group at Nanaimo. The Pacific States Marine Fisheries Commission (PSMFC) in Gladstone, Oregon maintains a second complete copy of the coastwide CWT data. By agreement through the Pacific Salmon Commission, PSMFC's Regional Mark Processing Center serves as the site for collecting and validating all CWT data for U.S. agencies for exchange with Canada. The U.S. and Canadian data are exchanged on an "as available" basis.

Coastwide CWT studies are carried out for a wide variety of purposes, including basic questions of stock distribution and relative survival, as well as the more complex issues of fisheries management and harvest allocation. PSC concerns are likewise varied and differ from region to region and by species. Some of these key applications are briefly reviewed.

There are approximately 24,000 CWT release records in the database for release years 1973 to 1993. During this period the tagging rate for chinook release groups averaged 16%, and for coho release groups averaged 14%. The number of coded wire recoveries has varied over the years. Peak CWT recoveries occurred in 1986 to 1988, which coincided with high tagging rates for contributing years, good ocean survival, and full participation in the tag recovery and reporting program by all agencies.

There is general agreement among agencies that commercial fisheries should be sampled for CWT's at 15-20% level in each stratum (defined by gear, week, species, area) in order to recover enough coded wire tags to generate reliable estimates of each tag group's contribution to the catch in that stratum. This is shown to not always be met by 1994 sampling programs.

RECOMMENDATIONS:

- The Working Group on Mark-Recovery Statistics should examine recent low survival rates and determine whether existing tagging and sampling rates continue to be appropriate.

- The Technical Committee on Data Sharing should encourage standardization among the various tagging and recovery agencies with respect to the interpretation and use of the fields in the exchange formats.
- The Technical Committee on Data Sharing should reconsider its designations of mandatory and optional fields in the exchange formats to ensure that information required for meaningful use of the data is included in the exchange.

Joint Technical Committee on Data Sharing. Report on the 1999 Status of PSC Database Development. TCDS (00)-1. February, 2000.

The commitment of Canada and the United States to develop a coast-wide stock assessment and data management system for Pacific salmon is detailed in the 1985 Memorandum of Understanding attached to the Pacific Salmon Treaty. In this memorandum, the Pacific Salmon Commission (PSC) formed the Data Sharing Committee (JTDS), placing it under the direction of the Standing Committee on Research and Statistics. The primary functions of the JTDS are to facilitate data exchange between Canada and the U.S. by developing, maintaining, and updating, as necessary, data exchange programs, identifying any problem areas that may exist, and developing standard methods of reporting and analyzing salmonid fisheries data of importance for both nations. Current key responsibilities include maintaining and updating the coastwide coded wire tag (CWT) database exchange format, monitoring the status of exchanged data, developing a coastwide catch and effort database exchange format, and addressing the new recording needs of mass-marking and selective fishery data.

Major topics under consideration by the Data Sharing Committee and its work groups in 1999 were:

1) Adoption of the catch and effort database format.
2) The upgrade of exchange formats to support relational databases.
3) Efforts to ensure Y2K compliance in the data exchange formats.
4) Data elements identified as necessary for evaluation of selective fisheries.

Recommendations by the Data Sharing Technical Committee to the Commission include:

- The Catch Data Exchange Work Group, having completed its charge to develop a catch and effort database format, should be disbanded and that the job of maintaining the format be given to the Data Standards Work Group.
- The Mark-Recovery Statistics Work Group should be disbanded, as it has been inactive since 1993.
- The Data Standards Work Group should continue as a distinct work group under the parent Data Sharing Committee.
- The Catch/Effort Database exchange should be sanctioned by the PSC and the Commissioners should encourage their agencies to begin exchanging these data.
- The exchange database formats should support the relational database form as proposed with Format 4.0.

- A study should be made to ensure that sampling and reporting of CWT data is sufficient for the analyses pertaining to mass marking and selective fisheries.
- Reporting agencies should review their data prior to submitting the data files to check for completeness of information, checking specifically for problem areas noted by the JTDS in their reports (e.g., fields 31 to 34 in the release records).
- The JTDS should look into developing a fisheries regulations file to complement the catch and effort and the CWT files.

G. SELECTIVE FISHERY EVALUATION COMMITTEE

Selective Fishery Evaluation Committee. Selective Fishery Evaluation Committee 1998 Annual Report. SFEC (99)-1. December, 1999.

Introduction

This report supplements the Interim Progress Report of the Selective Fishery Evaluation Committee (SFEC) on Mass Marking and Selective Fisheries provided to the Pacific Salmon Commission (PSC) in December 1998. This supplemental report provides information regarding mass marking and selective fisheries in four major parts: (1) chinook; (2) coho; (3) electronic tag detection capabilities; and (4) work schedules for the SFEC analysis and regional coordination work groups.

Chinook

Feasibility of Mass Marking

The technology to mass mark chinook has become available with the development of equipment to automatically remove adipose fins and insert coded-wire tags (CWT's).

Production Proposed for Mass Marking

As reported in January, WDFW has withdrawn its proposal to mass mark 1998 brood chinook production from Washington coastal facilities due to concerns regarding impacts to catch sampling programs in North/Central B.C. (NCBC) and Southeast Alaska (SEAK) and agency priorities for marking production from Puget Sound. WDFW and ODFW have provided proposals for mass marking of Puget Sound production and releases of lower Columbia River spring chinook. Agencies are reviewing potential impacts of the proposed marking schedule upon catch sampling programs in SEAK and NCBC.

Selective Fisheries

WDFW has withdrawn a proposal to implement mark selective fisheries for chinook in Puget Sound beginning in 1999, but has indicated its intent to propose selective fisheries again in 2000.

Viability of the CWT system for Chinook

The SFEC is unable to provide a definitive answer at this time as to whether or not the viability of the CWT system for chinook can be preserved under mass marking and selective fisheries. The SFEC has verified that the analytical procedures being developed to evaluate selective fisheries for coho using double index tagging (DIT) will not work for chinook. Alternative methods are under investigation and preliminary indications are sufficiently promising to warrant investment in further research. At present, the SFEC is focusing on the estimation of brood year cumulative impacts of selective fisheries for chinook by combining DIT with proportional migration algorithms. Current efforts are focused on determining if impacts of selective fisheries can be estimated using DIT under ideal conditions where perfect information on mass marking, natural and incidental mortality rates, and fishery recoveries is available for analysis. As investigations proceed, the SFEC intends to evaluate the impacts of uncertainty on estimation methods.

To preserve the potential use of DIT to maintain the viability of the CWT program for chinook salmon, the SFEC recommends DIT for those stocks that would be expected to be significantly impacted by fisheries that are presently under consideration for mark-selective retention. A list of stocks proposed for DIT has been developed for Puget Sound and Columbia River chinook stocks. Canada should consider DIT for Southern B.C. chinook salmon stocks that would be impacted in Puget Sound mark selective fisheries.

Since catch sampling using electronic tag detection (ETD) equipment is not presently anticipated in Northern/Central British Columbia and Southeast Alaska, the implications of failing to implement electronic tag detection capabilities coast-wide for the viability of the CWT system are being examined.

Additionally, it is important to note that any selective fisheries for chinook prior to 2004 will be impacting one or more age classes that have not had the opportunity to be double-index tagged. There is no question this will seriously impair CWT analyses for chinook stocks of brood years 1994-1997, U.S. or Canadian that are vulnerable to harvest in those selective fisheries.

Coho

Mass Marking and DIT releases

A list of mass marked 1996 brood coho production that are expected to contribute to 1999 fisheries has been provided for Washington, Oregon, and Southern British Columbia. Proposed mass marking schedules for 1997 brood coho for these regions are also presented in this report. There are no mass marking plans for Northern B.C. or Alaskan coho salmon stocks. A list of DIT stocks for 1996 brood releases of coho is included, as is a proposed list of double index tag groups for the 1997 brood.

F-V

Selective Fisheries

Agency reports documenting results of the limited 1998 selective fisheries for coho are included in this report. Specific proposals for mark selective fisheries in 1999 were developed during the domestic planning processes but were not available for evaluation in time for this report. Given the timing of these processes, the opportunity for the SFEC to review and provide advice regarding specific proposals for selective fisheries prior to implementation will be extremely limited.

Viability of the CWT system for Coho

The SFEC has initiated analysis of results of DIT experiments involving the 1995 coho salmon brood to determine the validity of assumptions underlying analytical procedures to estimate impacts of selective fisheries. In addition, the SFEC is in the process of evaluating variability and uncertainty regarding estimates of selective fishery impacts.

Potential problems with the capability of DIT-based procedures to estimate impacts of selective fisheries when significant sources of mortality (e.g., fisheries, predation) are not adequately sampled are identified in this report.

The SFEC has not been able to develop a means to allocate incidental mortalities to individual selective fisheries when multiple selective fisheries impact a stock. Losing this capability would impair the viability of the CWT system as defined in the 1995 report of the Ad-Hoc Selective Fishery Evaluation Committee (ASFEC). The SFEC has initiated research to investigate the capability of proportional migration algorithms to overcome this problem.

The SFEC has worked with the Data Sharing Committee to modify CWT reporting formats to accommodate the information required to report data on mass marking and selective fisheries.

Electronic Tag Detection

Some agencies continue to evaluate and field test equipment (tubes and wands) for electronic tag detection (ETD). Results indicate that ETD equipment is capable of detecting CWT's with a high degree of accuracy for coho and chinook salmon. Although some technical problems remain, it is expected that these can be readily resolved by working closely with the equipment manufacturer. The SFEC cautions, however, that ETD capabilities for chinook have not yet been tested under fully operational conditions and that ETD equipment has not yet been fully deployed within the limited range of mass marked coho production.

Work Schedules for the Selective Fishery Analytical Work Group (SFAWG) and the Regional Coordination Work Group (SFRCWG)

The SFEC is in the process of developing schedules for the analysis and regional coordination work groups to examine impacts of proposals for mass marking or selective fisheries. These schedules will attempt to integrate timing considerations involved in both PSC and domestic planning processes.

Publications of the Pacific Salmon Commission

PART VI
PUBLICATIONS OF THE PACIFIC SALMON COMMISSION

Documents listed herein are available to domestic fishery agencies of Canada and the United States, research organizations, libraries, scientists and others interested in the activities of the Commission, through the offices of the Secretariat, 600 - 1155 Robson Street, Vancouver, B.C., V6E 1B5. Photocopying charges may be levied for documents which are out of print.

Documents listed here are those which were published during the period from 1995/96 through 1999/2000 inclusive. For previous publications, please refer to the Pacific Salmon Commission 1989/90 Fifth Annual Report and 1994/95 Tenth Annual Report, or contact the Pacific Salmon Commission Library.

A. ANNUAL REPORTS

10. **Pacific Salmon Commission 1994/95 Tenth Annual Report. November 1995.**

    This report contains a summary account of the Commission's tenth year of operation.

11. **Pacific Salmon Commission 1995/96 Eleventh Annual Report. October, 1996.**

    This report contains a summary account of the Commission's eleventh year of operation.

12. **Pacific Salmon Commission 1996/97 Twelfth Annual Report. October, 1997.**

    This report contains a summary account of the Commission's twelfth year of operation.

13. **Pacific Salmon Commission 1997/98 Thirteenth Annual Report. November, 1998.**

    This report contains a summary account of the Commission's thirteenth year of operation.

14. **Pacific Salmon Commission 1998/99 Fourteenth Annual Report. November, 1999.**

    This report contains a summary account of the Commission's fourteenth year of operation.

B. REPORTS OF JOINT TECHNICAL COMMITTEES

i. Joint Chinook Technical Committee

28. TCCHINOOK (96)-1 - *1994 Annual Report.* February 15, 1996.

29. TCCHINOOK (97)-1 - *Incidental Fishing Mortality of Chinook Salmon: Mortality Rates Applicable to Pacific Salmon Commission Fisheries.* January, 1997.

30. TCCHINOOK (97)-2 - *Description of Calibration Procedures and Results of May 1997 Calibration of the Pacific Salmon Commission Chinook Model.* June 27, 1997.

31. TCCHINOOK (97)-3 - *Evaluation of Three Methods for Predicting the Abundance Index for Chinook Salmon Available to the Southeast Alaska Troll Fishery.* September, 1997.

32. TCCHINOOK (98)-1 - *Committee Response to Questions from the PSC Commissioners Regarding the U.S. and Canadian Proposals for Abundance-Based Regimes for Chinook Fisheries.* December 2, 1998.

33. TCCHINOOK (99)-1 - *Preliminary Retrospective Analysis of the U.S. and Canadian Proposals for Abundance-Based Regimes for Chinook Fisheries.* January 28, 1999.

34. TCCHINOOK (99)-2 - *1995 and 1996 Annual Report.* March 19, 1999.

35. TCCHINOOK (99)-3 - *Maximum Sustained Yield or Biologically Based Escapement Goals for Selected Chinook Salmon Stocks Used by the Pacific Salmon Commission's Chinook Technical Committee for Escapement Assessment. Volume 1.* December, 1999.

ii. Joint Chum Technical Committee

18. TCCHUM (96-1) - *Final 1993 Post Season Summary Report.* December, 1996

iii. Joint Coho Technical Committee

No reports were finalized for publication during this reporting period.

iv. Joint Northern Boundary Technical Committee

17. TCNB (96)-1 - *U.S./Canada Northern Boundary Area 1995 Salmon Fisheries Management Report and 1996 Preliminary Expectations.* January, 1996.

18. TCNB (97)-1 - *U.S./Canada Northern Boundary Area 1996 Salmon Fisheries Management Report and 1997 Preliminary Expectations.* January, 1997.

19. TCNB (98-1) - *U.S./Canada Northern Boundary Area 1997 Salmon Fisheries Management Report and 1998 Preliminary Expectations.* January, 1998.

20. TCNB (99-1) - *U.S./Canada Northern Boundary Area 1998 Salmon Fisheries Management Report and 1999 Preliminary Expectations.* January, 1999.

v. Joint Transboundary Technical Committee

25. TCTR (96)-1 - *Estimates of Transboundary River Salmon Production, Harvest, and Escapement, 1993.* April, 1996.

26. TCTR (96)-2 - *Transboundary River Salmon Production, Harvest, and Escapement Estimates, 1994.* May, 1996.

27. TCTR (97)-1 - *Salmon Management and Enhancement Plans for the Stikine, Taku, and Alsek Rivers, 1995.* April, 1997.

28. TCTR (97)-2 - *Estimates of Transboundary River Salmon Production, Harvest, and Escapement, 1995.* May, 1997

29. TCTR (98)-1 - *Transboundary River Sockeye Salmon Enhancement Activities - Final Report for Summer, 1992 to Spring, 1995.* May, 1998.

30. TCTR (99)-1 - *Salmon Management and Enhancement Plans for the Stikine, Taku and Alsek Rivers, 1998.* August, 1999.

31. TCTR (99)-2 - *Salmon Management and Enhancement Plans for the Stikine, Taku and Alsek Rivers, 1999.* August, 1999.

32. TCTR (00)-1 - *Estimates of Transboundary River Salmon Production, Harvest and Escapement and a Review of Joint Enhancement Activities in 1998.* February 5, 2000.

vi. Joint Technical Committee on Data Sharing

7. TCDS (99)-1 - *Report on the 1994 Status of the Coastwide Coded Wire Tag Database.* December, 1999.

8. TCDS (00)-1 - *Report on the 1999 Status of PSC Database Development.* February, 2000.

vii. Joint Interceptions Committee

No reports were finalized for publication during this reporting period.

viii. Selective Fishery Evaluation Committee

1. SFEC (99)-1 - *Selective Fishery Evaluation Committee 1998 Annual Report.* December, 1999.

C. REPORTS OF THE FRASER RIVER PANEL

6. *Report of the Fraser River Panel to the Pacific Salmon Commission on the 1992 Fraser River Sockeye Salmon Fishing Season.* PSC Staff. May 1996.
7. *Report of the Fraser River Panel to the Pacific Salmon Commission on the 1993 Fraser River Sockeye and Pink Salmon Fishing Season.* PSC Staff. August 1996.
8. *Report of the Fraser River Panel to the Pacific Salmon Commission on the 1994 Fraser River Sockeye Salmon Fishing Season.* PSC Staff. December, 1997.
9. *Report of the Fraser River Panel to the Pacific Salmon Commission on the 1995 Fraser River Sockeye and Pink Salmon Fishing Season.* PSC Staff. March, 1998.
10. *Report of the Fraser River Panel to the Pacific Salmon Commission on the 1996 Fraser River Sockeye Salmon Fishing Season.* PSC Staff. March, 1999.
11. *Report of the Fraser River Panel to the Pacific Salmon Commission on the 1997 Fraser River Sockeye and Pink Salmon Fishing Season.* PSC Staff. March, 1999.

D. TECHNICAL REPORT SERIES OF THE PACIFIC SALMON COMMISSION

6. Pacific Salmon Commission. *Pacific Salmon Commission Run-size Estimation Procedures: An Analysis of the 1994 Shortfall in Escapement of Late-run Fraser River Sockeye Salmon.* PSC Tech. Rep. No. 6, May, 1995.
7. White, B. *Genetic Stock Identification of Fraser River Pink Salmon: Methodology and Management Application.* PSC Tech. Rep. No. 7, May, 1996.
8. Xie, Y, G. Cronkite, T.J. Mulligan. *A Split Beam Echosounder Perspective on Migratory Salmon in the Fraser River: A Progress Report on the Split-Beam Experiment at Mission, B.C., in 1995.* PSC Tech. Rep. No. 8, December, 1997.
9. Gable, Jim. *Sockeye Stock Composition Estimates for Fraser River First Nations Catches (1989 to 1995): A Comparison Between Run Reconstruction Models and Scale-Based Discriminant Function Models.* PSC Tech. Rep. No. 9, February, 1998.

10. White, Bruce. *Fraser River Pink Salmon Catch and Exploitation Patterns: 1989-1995.* PSC Tech. Rep. No. 10, November, 1998.

E. PUBLICATIONS BY PACIFIC SALMON COMMISSION SECRETARIAT STAFF

11. White, B.A. and J. Gable. 1991. *In-Season Management of Fraser River Pink Salmon Using GSI Techniques.* In B.A. White and I.C. Guthrie (eds.) Proceedings of the 15th Northeast Pacific Pink and Chum Salmon Workshop. Pacific Salmon Commission, pp. 194-200.

12. Shaklee, J.B., D.C. Klaybor, S. Young and B.A. White. 1991. *Genetic stock structure of odd-year pink salmon, O. gorbuscha (Walbaum), from Washington and British Columbia and potential mixed-stock applications.* Journal of Fish Biology (1991) 39 (Supp. A), 21-34.

13. Walters, C. and J.C. Woodey. 1992. *Genetic Models for cyclic dominance in sockeye salmon (O. nerka).* Can. J. Fish. Aquat. Sci. 49(2): 281-292.

14. Cave, J.D. and W.J. Gazey. 1994. *A Pre-Season Simulation Model for Fisheries on Fraser River Sockeye Salmon (O. nerka).* Can. J. Fish. Aquat. Sci. 51(7): 1535-1549.

15. Benneheka, S.G., R.D. Routledge, I.G. Guthrie and J.C. Woodey. 1995. Estimation of in-river fish passage using a combination of transect and stationary hydroacoustic sampling. Can. J. Fish. Aquat. Sci. 52(2): 335-343.

20. Adkison, M.D., Peterman, R.M., Lapointe, M.F., Gillis, D.M., and Korman, J. 1996. *Alternative models of climatic effects on sockeye salmon productivity in Bristol Bay, Alaska, and the Fraser River*, British Columbia. Fish. Oceanogr. 5: 137-152.

21. Xie, Y 1995. *Acoustical tracking of ice failure process.* In M.J. Buckingham and J.R. Potter (eds.) Sea Surface Sounds. World Scientific, pp. 457-469.

22. Xie, Y. and D.M. Farmer. 1995. *The influence of pressure ridges on seismic signals due to thermal cracking of sea ice.* J. Acoust. Soc. Am. 97(2): 962-970.

23. Peterman, R.M., B.J. Piper, M.F. Lapointe, M.D. Adkison and C.J. Walters. 1997. *Patterns of covariation in survival rates of British Columbian and Alaskan sockeye salmon (Oncorhynchus nerka) stocks.* Can. J. Fish. Aquat. Sci. 55(11): 2503-2517.

24. Pyper, B.J., R.M. Peterman, M.F. Lapointe and C. J. Walters. 1999. *Patterns of covariation in length and age at maturity of British Columbia and Alaska sockeye salmon (Oncorhynchus nerka) stocks,* in press, Can. J. Fish. Aquat. Sci. 56(6): 1046-1057.

25. Cronkite, G.M.W., Y. Xie, and A.P. Gray. 2000. *Active tracking sonar study of salmon migration behaviour at Mission, British Columbia, 1998.* Can. Manuscr. Rep. Fish. Aquat. Sci. 2506. 47 p.

26. Woodey, J.C. 2000. *International Management of Fraser River sockeye salmon.* In E.E. Knudsen et al. (eds.) Sustainable Fisheries Management: Pacific Salmon. CRC Press. pp. 207-218.

27. McKinnell, S.M., C.C. Woodey, M. Lapointe, J.C. Woodey, K.E. Kostow, J. Nelson, and K.D. Hyatt. 1999. *Reviewing the evidence that adult sockeye salmon strayed from the Fraser River and spawned in other rivers in 1997.* PICES Scientific report. 10. pp. 73-75.

28. J.S. Macdonald, I.V. Williams, and J.C. Woodey. 2000. *The effects of in-river conditions on migrating sockeye salmon (Oncorhynchus nerka).* In J.S. Macdonald (ed.) Mortality during the migration of Fraser River sockeye salmon (Oncorhynchus nerka): a study of the effect of ocean and river environmental conditions in 1997. Can. Tech. Rep. Fish. Aguat. Sci. 2315. pp. 39-57.

F. REPORTS OF THE INTERNATIONAL PACIFIC SALMON FISHERIES COMMISSION

Responsibility for maintenance of the library of the International Pacific Salmon Fisheries Commission, on its termination December 31, 1985, was transferred to the Pacific Salmon Commission. Documents in the Library include historical archival papers which are available to researchers and other interested parties through contact with the Pacific Salmon Commission's Librarian.

Publication of John F. Roos' History of the International Pacific Salmon Fisheries Commission, and P. Gilhousen's Estimation of Fraser River Sockeye Escapements ended all publication series of the International Pacific Salmon Fisheries Commission. Copies of all in-print Progress Reports and Bulletins of the International Pacific Salmon Fisheries Commission are available free of charge through the Library of the Pacific Salmon Commission. Copies of the History of the International Pacific Salmon Fisheries Commission may also be ordered through the Library of the Pacific Salmon Commission.

G. DOCUMENTS SUBMITTED BY THE PARTIES

In compliance with provisions of the Treaty, the Parties provide annual post-season fishery reports and updates on their respective salmonid enhancement programs to the Commission. Documents received during 1995/96 were:

1. *Preliminary 1995 Post-Season Report for United States Fisheries of Relevance to the Pacific Salmon Treaty.* United States Section, Pacific Salmon Commission. December, 1995.

2. *1995 Post-Season Report for Canadian Treaty Limit Fisheries.* Canada Department of Fisheries and Oceans. December 6, 1995.

3. *1995 Annual Report on the Salmonid Enhancement Activities of the United States in the Areas of the Pacific Salmon Treaty.* United States Section, Pacific Salmon Commission. February 8, 1996.

4. *1995 Update Report for the Salmonid Enhancement Program in British Columbia.* Canada Department of Fisheries and Oceans. May 17, 1996.

Documents received during 1996/97 were:

1. *Post-Season Report for Canadian Treaty Limit Fisheries.* Canada Department of Fisheries and Oceans. December 10, 1996.

2. *Preliminary 1996 Post-Season Report for United States Fisheries of Relevance to the Pacific Salmon Treaty.* United States Section, Pacific Salmon Commission. December, 1996.

3. *Update Report for the Salmonid Enhancement Program in British Columbia.* Canada Department of Fisheries and Oceans. November 30, 1996.

4. *Annual Report on the Salmonid Enhancement Activities of the United States in the Areas of the Pacific Salmon Treaty.* United States Section, Pacific Salmon Commission. April 22, 1997.

Documents received during 1997/98 were:

1. *Preliminary 1997 Post-Season Report for United States Fisheries of Relevance to the Pacific Salmon Treaty.* United States Section, Pacific Salmon Commission. December, 1997.

2. *Post-Season Report for Canadian Treaty Limit Fisheries.* Canada Department of Fisheries and Oceans. December 3, 1997.

3. *Update Report for the Salmonid Enhancement Program in British Columbia.* Canada Department of Fisheries and Oceans. February 4, 1998.

Documents received during 1998/99 were:

1. Preliminary 1998 Post-Season Report for United States Fisheries of Relevance to the Pacific Salmon Treaty. United States Section, Pacific Salmon Commission. December, 1998.

2. *1998 Post-Season Report for Canadian Treaty Limit Fisheries.* Fisheries and Oceans Canada. December 2, 1998.

3. *1997 Annual Report on the Salmonid Enhancement Activities of the United States in the Areas of the Pacific Salmon Treaty.* United States Section, Pacific Salmon Commission. August 1998.

4. *1998 Canadian Salmonid Enhancement Report.* Canadian Section, Pacific Salmon Commission. March 19, 1999.

Documents received during 1999/2000 were:

1. *Preliminary 1999 Post-Season Report for United States Fisheries of Relevance to the Pacific Salmon Treaty.* United States Section, Pacific Salmon Commission. December, 1999.

2. *1999 Post-Season Report for Canadian Treaty Limit Fisheries.* Fisheries and Oceans Canada. December, 1999.

Report of the Auditors for 1999/2000

PART VII

AUDITORS' REPORT AND FINANCIAL STATEMENTS FOR THE PERIOD APRIL 1, 1999 TO MARCH 31, 2000

AUDITORS' REPORT TO THE COMMISSIONERS

We have audited the statement of financial position of the Pacific Salmon Commission as at March 31, 2000 and the statements of financial activities and fund balances for the year then ended. These financial statements are the responsibility of the Commission's management. Our responsibility is to express an opinion on these financial statements based on our audit.

We conducted our audit in accordance with Canadian generally accepted auditing standards. Those standards require that we plan and perform an audit to obtain reasonable assurance whether the financial statements are free of material misstatement. An audit includes examining, on a test basis, evidence supporting the amounts and disclosures in the financial statements. An audit also includes assessing the accounting principles used and significant estimates made by the Commission, as well as evaluating the overall financial statement presentation.

In our opinion, these financial statements present fairly, in all material respects, the financial position of the Commission as at March 31, 2000 and the results of its operations for the year then ended in accordance with the Financial Regulations of the Commission as described in note 1 to the financial statements.

KPMG LLP
Chartered Accountants

New Westminster, Canada
May 12, 2000

PACIFIC SALMON COMMISSION

Statement of Financial Position

March 31, 2000, with comparative figures for 1999

	General Fund	Working Capital Fund	Capital Asset Fund	2000 Consolidated	1999 Consolidated
Assets					
Current assets:					
Cash and cash equivalents	$ 407,656	$ 100,661	$ -	$ 508,317	$ 1,030,668
Accounts receivable (note 3)	38,269	-	-	38,269	38,348
Interest receivable	2,064	-	-	2,064	2,522
Prepaid expenses	17,707	-	-	17,707	19,081
	465,696	100,661	-	566,357	1,090,619
Capital assets (note 2)	-	-	246,520	246,520	183,224
	$ 465,696	$ 100,661	$ 246,520	$ 812,877	$ 1,273,843
Northern Boundary and Transboundary Rivers Restoration and Enhancement Fund:					
Cash and term deposits				$14,581,071	$ -
Interest receivable				101,056	-
				$14,682,127	$ -
Southern Boundary Restoration and Enhancement Fund:					
Cash and term deposits				$14,591,821	$ -
Interest receivable				101,140	-
				$14,692,961	$ -
Yukon River Salmon Restoration and Enhancement Fund:					
Cash and term deposits				$ -	$ -
Liabilities and Fund Balances					
Current liabilities:					
Accounts payable and accrued liabilities	$ 91,182	$ -	$ -	$ 91,182	$ 113,480
Fund balance (note 3)	374,514	100,661	246,520	721,695	1,160,363
	$ 465,696	$ 100,661	$ 246,520	$ 812,877	$ 1,273,843
Northern Boundary and Transboundary Rivers Restoration and Enhancement Fund:					
Fund balance				$14,682,127	$ -
Southern Boundary Restoration and Enhancement Fund:					
Fund balance				$14,692,961	$ -
Yukon River Salmon Restoration and Enhancement Fund:					
Fund balance				$ -	$ -

On behalf of the Commission:

Chair, Standing Committee on Finance and Administration

Vice Chair, Standing Committee on Finance and Administration

See accompanying notes to financial statements.

PACIFIC SALMON COMMISSION

Statement of Financial Activities and Fund Balances

Year ended March 31, 2000, with comparative figures for 1999

	General Fund	Working Capital Fund	Capital Asset Fund	2000 Consolidated	1999 Consolidated
Fund balance, beginning of year	$ 880,701	$ 96,438	$ 183,224	$ 1,160,363	$ 1,055,683
Revenue:					
Contributions from contracting parties	1,600,000	-	-	1,600,000	1,600,000
Interest	41,768	4,223	-	45,991	61,926
Gain on disposal of capital assets	2,087	-	-	2,087	7,175
Other	7,301	-	-	7,301	750
Test fishing	1,055,659	-	-	1,055,659	1,270,690
	2,706,815	4,223	-	2,711,038	2,940,541
Expenditures:					
Amortization	-		122,182	122,182	116,447
Salaries and employee benefits	1,578,957	-	-	1,578,957	1,427,346
Travel and transportation	128,586	-	-	128,586	62,618
Rents and communication	110,845	-	-	110,845	94,007
Printing and reproductions	10,963	-	-	10,963	11,579
Contract services	260,740	-	-	260,740	206,592
Materials and supplies	54,289	-	-	54,289	32,171
Test fishing	883,144	-	-	883,144	885,101
	3,027,524	-	122,182	3,149,706	2,835,861
Excess (deficiency) of revenue over expenditures	(320,709)	4,223	(122,182)	(438,668)	104,680
Transfer to capital asset fund	(185,478)	-	185,478	-	-
Fund balance, end of year	$ 374,514	$ 100,661	$ 246,520	$ 721,695	$ 1,160,363

See accompanying notes to financial statements.

PACIFIC SALMON COMMISSION

Yukon River Salmon Restoration and Enhancement Fund

Statement of Financial Activities and Fund Balances

Year ended March 31, 2000, with comparative figures for 1999

	2000	1999
Fund balance, beginning of year	$ -	$ -
Revenue:		
Contributions	-	48,931
Foreign exchange on opening balance	-	-
Interest earned on term deposit	-	-
	-	48,931
Transfers to the Yukon River Panel	-	48,931
Fund balance, end of year	$ -	$ -

See accompanying notes to financial statements.

PACIFIC SALMON COMMISSION

Northern Boundary and Transboundary Rivers Restoration and Enhancement Fund

Statement of Financial Activities and Fund Balances

Year ended March 31, 2000, with comparative figures for 1999

	2000	1999
Fund balance, beginning of year	$ -	$ -
Revenue:		
Contributions	14,592,985	-
Interest earned on term deposit	188,315	-
	14,781,300	-
Expenditures	173	-
Net revenue before foreign exchange translation adjustment	14,781,127	-
Foreign exchange translation adjustment	(99,000)	-
Fund balance, end of year	$ 14,682,127	$ -

See accompanying notes to financial statements.

PACIFIC SALMON COMMISSION

Southern Boundary Restoration and Enhancement Fund

Statement of Financial Activities and Fund Balances

Year ended March 31, 2000, with comparative figures for 1999

	2000	1999
Fund balance, beginning of year	$ -	$ -
Revenue:		
Contributions	14,685,531	-
Interest earned on term deposit	200,584	-
	14,886,115	-
Expenditures	173	-
Net revenue before foreign exchange translation adjustment	14,885,942	-
Foreign exchange translation adjustment	(192,981)	-
Fund balance, end of year	$ 14,692,961	$ -

See accompanying notes to financial statements.

Nature of organization:

The Pacific Salmon Commission was established by Treaty between the Governments of Canada and the United States of America to promote cooperation in the management, research and enhancement of Pacific salmon stocks. The Treaty was ratified on March 18, 1985 and the Commission commenced operations on September 26, 1985.

1. Significant accounting policies:

(a) Revenue recognition:

The Commission follows the restricted fund method of accounting for contributions from contracting parties.

(b) Fund accounting:

The General Fund includes funds provided annually through contributions from the Contracting Parties and any net surplus obtained through the test fishing program. By agreement of the Parties, any unexpended balance remaining at the end of one fiscal year may be used to offset contributions in the following year or may be used to offset a shortfall between contributions and approved expenditures in the following year.

The Capital Assets Fund reflects the Commission's capital asset transactions. Amortization is charged to the Capital Fund.

The Working Capital Fund represents monies contributed by the Parties to be used temporarily pending receipt of new contributions from the Parties at the beginning of a fiscal year, or for special programs not contained in the regular budget but approved during the fiscal year. Any surplus above a pre-determined fixed limit in the account at the end of the fiscal year is transferred to the General fund and is treated as income.

The Yukon River Salmon Restoration and Enhancement Fund reflects funding provided on the creation of a separate entity, the Yukon River Panel.

The Northern Boundary and Transboundary Rivers Restoration and Enhancement Fund and the Southern Boundary Restoration and Enhancement Fund reflects funding to be held by the Commission. The income earned on these contributions is to be distributed by the Commission as directed by the Northern Enhancement Committee and the Southern Enhancement Committee.

c) Basis of accounting:

The operations of the Commission are generally accounted for on an accrual basis except that purchase order expenditures are recognized at the time that the commitment for goods and services are made, rather than at the time that the goods or services are delivered.

1. Significant accounting policies (continued):

(d) Capital assets:

Capital assets are stated at cost. Costs of repairs and replacements of a routine nature are charged as a current expenditure while those expenditures which improve or extend the useful life of the assets are capitalized. Amortization is provided using the straight-line method of rates sufficient to amortize the costs over the estimated useful lives of the assets. The rates of amortization used on a annual basis are:

Automobiles	20%
Boats	20%
Computer equipment and software	30%
Equipment	20%
Furniture and fixtures	10%

(e) Income taxes:

The Commission is a non-taxable organization under the Privileges and Immunities (International Organizations) Act (Canada).

(f) Foreign exchange translation:

Transactions originating in foreign currencies are translated at the exchange rate prevailing at the transaction dates. Assets and liabilities denominated in foreign currency at the balance sheet date are translated to equivalent Canadian amounts at the current rate of exchange. Foreign exchange gains and losses resulting from translation are included in the determination of excess or deficiency of revenue over expenditures.

(g) Use of estimates:

The preparation of financial statements in conformity with Canadian generally accepted accounting principles requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities and disclosure of contingent assets and liabilities at the date of the financial statements and the reported amounts of revenues and expenses during the reporting period. Significant areas requiring the use of management estimates relate to the determination of the valuation of accounts receivable, useful lives of capital assets for amortization and accrued liabilities. Actual results could differ from those estimates. Adjustments, if any, will be reflected in operations in the period of settlement.

(h) Statement of cash flows:

A statement of cash flows has not been provided as it would not provide any additional meaningful information.

2. Capital assets:

	Cost	Accumulated amortization	2000 Net book value	1999 Net book value
Automobiles	$ 128,724	$ 94,324	$ 34,400	$ 49,006
Boats	88,805	83,098	5,707	7,776
Computer equipment	459,240	420,423	38,817	41,108
Equipment	598,487	468,766	129,721	70,690
Furniture and fixtures	251,338	233,140	18,198	4,158
Computer software	119,868	113,409	6,459	10,486
Leasehold improvements	34,219	21,001	13,218	-
	$ 1,680,681	$ 1,434,161	$ 246,520	$ 183,224

3. General fund balance:

The Commission has approved a carryover of the unexpended funds in the General Fund to be utilized as follows:

		2000	1999
(a)	Continuing operations	$ 356,807	$ 861,620
(b)	Reserve for prepaid expenses	17,707	19,081
		$ 374,514	$ 880,701

4. Pension plan:

The Commission maintains a defined benefit pension plan for its employees. Actuarial valuations of this pension plan are carried out triennially and provide estimates of present value of accrued pension benefits at a point in time, calculated on the basis of various assumptions with respect to pension plan costs and rates of return on investments.

At the date of the most recent actuarial valuation at January 1, 1999, the present market value of related assets exceeds accrued benefits by $42,000.

5. Financial instruments:

The financial instruments consist of cash and cash equivalents, amounts receivable, interest receivable and amounts payable and accrued liabilities. The carrying amounts of these financial instruments are a reasonable estimate of their fair values.

Appendices

Appendix A

Correspondence to Parties from Chief Negotiators regarding proposed Agreement related to the Pacific Salmon Treaty - June 23, 1999

The Honourable Lloyd Axworthy, P.C.
The Honourable David Anderson, P.C.
Secretary of State Madeleine Albright

We have the honour to forward to you a proposed Agreement relating to the Pacific Salmon Treaty and to recommend its conclusion by the Government of Canada and the Government of the United States of America.

The Agreement consists of the following elements:

(a) amendments to Annex I and Annex IV of the Pacific Salmon Treaty pursuant to Article XIII of the Treaty, together with related Understandings, as set out in Attachment A;

(b) provisions for the Management of Northern Boundary Coho as set out in Attachment B;

(c) provisions for a Northern Boundary and Transboundary Rivers Restoration and Enhancement Fund and a Southern Boundary Restoration and Enhancement Fund as set out in Attachment C;

(d) provisions for Renewed Cooperation on Scientific and Institutional Matters as set out in Attachment D; and

(e) provisions relating to Habitat and Restoration as set out in Attachment E.

Attachments A and B are intended to expire at the end of December 2008, except for the amendment to Annex IV, Chapter 4, regarding Fraser River Sockeye and Pink Salmon, which is intended to expire at the end of December 2010. Attachment A may be amended, renewed or terminated in accordance with Article XIII of the Treaty. Attachment B may be amended, renewed or terminated by agreement of the Parties. Attachments C through E are intended to continue for the duration of the Treaty unless amended or terminated by agreement of the Parties.

It is proposed that compliance with this Agreement shall constitute compliance by the Parties with their obligations under Article III of the Treaty.

It is intended that the obligations under this Agreement would be subject to the obtaining of specific legislative authority from the United States Congress for the Northern Boundary and Transboundary Rivers Restoration and Enhancement Fund and the Southern Boundary Restoration and Enhancement Fund. Such Congressional action (i.e., authorizations and appropriations) lies within the discretion of the Congress. Nevertheless, the United States Government would undertake to seek such legislative authority at an early date. In the event that initial funds are not made available by December 1999; or in the event that additional installment payments are not made by the end of U.S. Fiscal Year 2001 or by the end of U.S. Fiscal Year 2002; or in the event that total payment for the two funds is not made available by the end of U.S. Fiscal Year 2003, the obligations under this Agreement would be suspended until such funds are available, unless the Parties agree otherwise.

It is proposed that each Government agree to take the necessary steps to implement the obligations pursuant to this Agreement consistent with its national laws. In particular, implementation by the Government of the United States of this Agreement would be contingent on a determination that the Agreement satisfies the legal requirements under the United States' Endangered Species Act. The Government of the United States would agree to fulfill those requirements as expeditiously as possible consistent with U.S. law and keep the Government of Canada informed regarding this matter and advise it of the date on which the statutory requirements have been met. In the event that the Government of the United States has failed to fulfill the legal requirements of the Endangered Species Act by December 31, 1999, the obligations pursuant to this Agreement would be suspended pending fulfillment of those legal requirements, unless the Parties agree otherwise.

It is recommended that the Parties take the actions necessary to conclude this Agreement.

The Agreement represents a commitment to abundance-based management for the salmon fisheries covered by the Treaty. This important, new conservation-based approach will require adequate resources by each Party to ensure that the necessary scientific and management needs are met. In particular, the coast-wide Chinook Chapter (Annex IV, Chapter 3) which represents a departure from previous Annexes, is dependent upon high quality fishery and stock assessment data being collected by management agencies coupled with time-consuming analysis of the data by the Chinook Technical Committee. Management agencies are urged to provide adequate resources, both staff and time, to the Chinook Technical Committee for successful implementation.

The goal of the Agreement is to regulate the harvest of salmon in order to rebuild naturally reproducing stocks and sustain them at optimum production. However, harvest controls alone will not lead to recovery of salmon stocks. Two complementary strategies are required: first, effective and comprehensive coastwide conservation-based harvesting regimes must be implemented in accordance with this framework; and second, appropriate freshwater habitat must be protected or restored to allow for successful salmon migration, spawning and juvenile rearing. Consequently, achievement of the overall stock rebuilding goal requires that harvest management objectives be complemented by programs in freshwater to maintain productive habitat or to restore habitat when it is a constraint to sustaining populations at optimum production. Fishery arrangements are not a substitute for sound habitat management. Governments, communities and other interests are urged to work diligently to protect salmon habitat and to continue to take the necessary measures to ensure that freshwater habitat is not a limiting factor for achievement of salmon production goals.

Donald McRae
Chief Negotiator for Canada

James Pipkin
Chief Negotiator for the United States of America

June 23, 1999

Appendix B

Exchange of Diplomatic Notes regarding comprehensive agreement between the Parties Related to the Pacific Salmon Treaty signed on June 23, 1999

Canadian Embassy Ambassade du Canada

Ambassador Thomas Pickering
Acting Secretary of State
Washington, D.C.
June 30, 1999

Note No. 0225

Excellency,

I have the honour to refer to the recent discussions of our respective Chief Negotiators relating to the Treaty between the Government of Canada and the Government of the United States of America Concerning Pacific Salmon, with Annexes, signed at Ottawa, January 28, 1985 (the "Treaty"). As a result of the discussions, I have the honour to propose an Agreement between our two Governments comprised of the following elements:

1. Pursuant to Article XIII of the Treaty, Annex I of the Treaty shall be amended as set out in Attachment A and Annex IV shall be replaced in its entirety by Annex IV, with related understandings, as set out in Attachment A.
2. Provisions regarding Northern Boundary coho salmon shall be as set out in Attachment B.
3. A Northern Boundary and Transboundary Rivers Restoration and Enhancement Fund and a Southern Boundary Restoration and Enhancement Fund shall be established in accordance with the terms and conditions set out in Attachment C.
4. Provisions regarding renewed cooperation on scientific and institutional matters shall be as set out in Attachment D.
5. Provisions regarding cooperation relating to habitat of stocks of Pacific salmon subject to the Treaty shall be as set out in Attachment E.
6. The obligations under this Agreement shall be subject to the obtaining of specific legislative authority from the United States Congress for the Northern Boundary and Transboundary Rivers Restoration and Enhancement Fund and the Southern Boundary Restoration and Enhancement Fund. Such Congressional action (i.e., authorization and appropriation) lies within the discretion of the Congress. Nevertheless, the United States Government shall undertake to seek such legislative authority at an early date. In the event that the United States Government does not make initial funds available for the Funds by December 31, 1999, or in the event that additional installment payments to these Funds are not made by the end of U.S. fiscal year 2001 or by the end of U.S. fiscal year 2002, or in the event that total payment for the two Funds is not made available by the end of U.S. fiscal year 2003, all of the obligations under this Agreement shall be suspended until such funds are available, unless our two Governments agree otherwise.
7. Each Government shall take the necessary steps to implement the obligations under this Agreement consistent with its national laws. In particular, implementation of this Agreement by the United States Government shall

be contingent on a determination that the Agreement satisfies the legal requirements under the United States' Endangered Species Act. The United States' Government shall fulfill those requirements as expeditiously as possible consistent with United States' law and shall keep the Government of Canada informed regarding this matter; and advise it of the date on which the legal requirements have been met. In the event that the United States' Government has failed to fulfil the legal requirements of the Endangered Species Act by December 31, 1999, the obligations under this Agreement shall be suspended pending fulfilment of those legal requirements, unless our two Governments agree otherwise.

8. This Agreement shall expire on December 31, 2008, except for the amendment to Annex IV, Chapter 4, regarding Fraser River Sockeye and Pink salmon, which shall expire on December 31, 2010, and Attachments C through E, which shall continue for the duration of the Treaty unless amended or terminated by written agreement of our two Governments. Thereafter, this Agreement may be renewed, revised or terminated by written agreement of our two Governments; in the case of the Annexes, they may be renewed, revised or terminated in accordance with Article XIII of the Treaty. If the Treaty is terminated in accordance with Article XV (2) thereof, this Agreement shall terminate effective from the date of termination of the Treaty.

9. Compliance with this Agreement shall constitute compliance by our two Governments with their obligations under Article III of the Treaty.

10. A French language text of the attachments to this Note shall be verified and agreed upon by September 30, 1999 through an exchange of diplomatic notes.

If the above proposal is acceptable to the Government of the United States of America, I have the honour to propose that this Note, with its attachments, which shall be equally authentic in English and French, and your Excellency's affirmative Note in reply shall constitute an Agreement between our two Governments which shall enter into force on the date of your Note in reply.

Accept, Excellency, the renewed assurances of my highest consideration.

Canadian Embassy - Ambassade du Canada
WASHINGTON

Raymond Chrétien
Ambassador

DEPARTMENT OF STATE
WASHINGTON

June 30, 1999

His Excellency
Raymond A. Chretien,
Ambassador of Canada.

Excellency:
I have the honor to acknowledge receipt of your note No. 0225, dated June 30, 1999, with attachments, which reads as follows:

> I have the honour to refer to the recent discussions of our respective Chief Negotiators relating to the Treaty between the Government of Canada and the Government of the United States of America Concerning Pacific Salmon, with Annexes, signed at Ottawa January 28, 1985 (the "Treaty"). As a result of the discussions, I have the honour to propose an Agreement between our two Governments comprised of the following elements:
>
> 1. Pursuant to Article XIII of the Treaty, Annex I of the Treaty shall be amended as set out in Attachment A and Annex IV shall be replaced in its entirety by Annex IV, with related understandings, as set out in Attachment A.
>
> 2. Provisions regarding Northern Boundary coho salmon shall be as set out in Attachment B.
>
> 3. A Northern Boundary and Transboundary Rivers Restoration and Enhancement Fund and a Southern Boundary Restoration and Enhancement Fund shall be established in accordance with the terms and conditions set out in Attachment C.
>
> 4. Provisions regarding renewed cooperation on scientific and institutional matters shall be as set out in Attachment D.
>
> 5. Provisions regarding coordination relating to habitat of stocks of Pacific salmon subject to the Treaty shall be as set out in Attachment E.
>
> 6. The obligations under this Agreement shall be subject to the obtaining of specific legislative authority from the United States Congress for the Northern Boundary and Transboundary Rivers Restoration and Enhancement Fund and the Southern Boundary Restoration and Enhancement Fund. Such Congressional action (i.e., authorization and appropriation) lies within the discretion of the Congress. Nevertheless, the United States Government shall undertake to seek such legislative authority at an early date. In the event that the United States Government does not make initial funds available for the Funds by December 31, 1999, or in the event that additional installment payments to these Funds are not made by the end of U.S. fiscal year 2001 or by the end of U.S. fiscal year 2002, or in the event that total payment for the two Funds is not made available by the end of U.S. fiscal year 2003, all of the obligations under this Agreement shall be suspended until such funds are available, unless our two Governments agree otherwise.
>
> 7. Each Government shall take the necessary steps to implement the obligations under this Agreement consistent with its national laws. In particular, implementation of this Agreement by the United States Government shall be contingent on a determination that the Agreement satisfies the legal requirements under the United States Endangered Species Act. The United States Government shall fulfill those requirements as expeditiously as possible consistent with United States law and shall keep the Government of Canada informed regarding this matter, and advise it of the date on which the legal requirements have been met. In the event that the United States Government has failed to fulfil the legal requirements of the Endangered Species Act by December 31, 1999, the obligations under this Agreement shall be suspended pending fulfillment of those legal requirements, unless our two Governments agree otherwise.

8. This Agreement shall expire December 31, 2008, except for the amendment to Annex IV, Chapter 4, regarding Fraser River Sockeye and Pink salmon, which shall expire December 31, 2010, and Attachments C through E, which shall continue for the duration of the Treaty unless amended or terminated by written agreement of our two Governments. Thereafter, this Agreement may be renewed, revised or terminated by written agreement of our two Governments; in the case of the Annexes, they may be renewed, revised or terminated in accordance with Article XIII of the Treaty. If the Treaty is terminated in accordance with Article XV (2) thereof, this Agreement shall terminate effective from the date of termination of the Treaty.

9. Compliance with this Agreement shall constitute compliance by our two Governments with their obligations under Article III of the Treaty.

10. A French language text of the attachments to this Note shall be verified and agreed upon by September 30, 1999 through an exchange of diplomatic notes.

If the above proposal is acceptable to the Government of the United States of America, I have the honour to propose that this Note, with its attachments, which shall be equally authentic in English and French, and your Excellency's affirmative Note in reply shall constitute an Agreement between our two Governments which shall enter into force on the date of your Note in reply.

Accept, Excellency, the renewed assurances of my highest consideration.

I have the further honor to inform you that the Government of the United States of America accepts the proposal contained in Your Excellency's note and to confirm that your note, with its attachments, and this note in reply shall constitute an Agreement between our two Governments, which shall enter into force on the date of this note. Accept, Excellency, the renewed assurances of my highest consideration.

Acting Secretary of State

Appendix C

Summary of Pacific Salmon Agreement reached by United Sates and Canadian negotiators

Negotiators representing Canada and the United States reached a comprehensive agreement June 3, 1999, that resolved long-standing disputes relating to Pacific salmon and the Pacific Salmon Treaty. The agreement is the result of an intensive series of negotiations that extended over several years.

Key features of the agreement:

1. The agreement establishes abundance-based fishing regimes for the major salmon intercepting fisheries in the US and Canada. These regimes, which allow catches in fisheries to vary from year-to-year, are designed to implement the conservation and harvest sharing principles of the Pacific Salmon Treaty. Larger catches will be allowed when abundance is higher and, importantly, catches will be significantly constrained in years when abundance is down. This type of regime will be more responsive to the conservation requirements of salmon than the fixed ceilings that existed under the original Treaty arrangements.

2. Two bilaterally-managed regional funds would be established. The funds would be used to improve fisheries management and aid the country's efforts to recover weakened salmon stocks. Subject to the availability of appropriated funds, the US will contribute $75 million and $65 million dollars ($US) to a northern and southern fund, respectively, over a four-year period.

3. The agreement includes provisions to enhance bilateral cooperation, improve the scientific basis for salmon management, and apply institutional changes to the Pacific Salmon Commission.

Principal benefits of the agreement:

1. The agreement ushers in a new age of cooperation between the US and Canada concerning the management of salmon.
2. The agreement addresses the conservation and harvest sharing principles of the 1985 Pacific Salmon Treaty.
3. The agreement brings stability to the management of fisheries that affect shared salmon stocks.
4. The agreement provides a firm and complementary base for other salmon recovery efforts, such as habitat restoration, underway in both countries to restore depleted stocks of salmon.

An overview of the agreement:

I. Fishery regimes. Most elements of the agreement are contained in several new "chapters" that replace earlier expired versions of Chapters 1-6 of Annex IV of the Pacific Salmon Treaty. Additionally, an understanding was reached regarding management of certain northern fisheries affecting coho salmon, a topic not specifically covered in previous agreements.

   Most of the new fishery arrangements will be in effect for ten years, beginning in 1999. The arrangement concerning the US share of Fraser sockeye will be effect for twelve years, also beginning in 1999. The governments would agree that the new fishery regimes are consistent with all the principles of the Pacific Salmon Treaty, and that compliance with those regimes constitutes satisfaction of all obligations under those principles.

Transboundary Rivers (Chapter 1). This agreement specifies arrangements for sockeye, coho, chinook, and pink salmon management for several rivers that flow from Canada to the Pacific Oceans through the Alaskan panhandle, including the Stikine, Taku and Alsek rivers. An attachment to the agreement describes programs and associated costs for joint enhancement of sockeye salmon in the Taku and Stikine rivers.

Northern British Columbia and Southeast Alaska (Chapter 2). This agreement addresses the management of sockeye and pink salmon fisheries in southeast Alaska and northern British Columbia. It specifies how the fisheries will be managed to achieve conservation and fair sharing of salmon stocks that intermingle in the border area. The fixed catch ceilings contained in the expired agreements are replaced with abundance-based provisions that allow harvests to vary from year to year depending on the abundance of salmon. Of particular note, because they resolve long-contentious issues, are agreements governing Alaska's purse seine fisheries near Noye's Island (District 104) and the gillnet fishery at Tree Point (District 101), and Canada's various marine net fisheries and its troll fishery for pink salmon in Canadian Area 1.

Chinook Salmon (Chapter 3). Because they pass through fisheries regulated by many jurisdictions in both Canada and the US, chinook salmon have been the focus of increasing concern and controversy in recent years. Although some chinook populations are relatively healthy, particularly the "far north migrating stocks" that tend to migrate to the marine waters near Alaska to grow and mature, others have been so diminished in recent years that they have been "listed" by the US federal government under the Endangered Species Act (ESA). Many factors in addition to harvest have contributed to the decline of these stocks. The conservation-based fishery regimes established by this new agreement will help to ensure the effectiveness of public and private investments in habitat restoration and other aspects of salmon recovery.

The new chinook regime encompasses marine and certain freshwater fisheries in Alaska, Canada, Washington, and Oregon. All chinook fisheries will be managed based on abundance, replacing the fixed catch quotas that applied in previous regimes. Two types of fisheries have been designated: (1) those that will be managed based on the aggregate abundance of chinook salmon present in the fishery, and (2) those that will be managed based on the status of individual stocks or stock groups in the fishery. The three that have been designated for aggregate abundance-based management (called "AABM" fisheries) are ocean fisheries that occur in large areas and affect a complex aggregation of many stocks. They are:

- the Southeast Alaska troll, net and sport fishery;
- the Northern British Columbia troll and Queen Charlotte Islands sport fishery; and
- the West Coast Vancouver Island troll and outside sport fishery.

All other ocean and freshwater fisheries impacting chinook salmon have been designated for individual stocks-based management (called "ISBM" fisheries). Fisheries in this category include, but are not limited to:

- the central British Columbia troll, net and sport fisheries;
- the southern B.C. marine net, troll and sport fisheries (other than the west coast Vancouver Island troll and outside sport fishery); and;
- all net, sport and troll marine and freshwater fisheries in Washington, Oregon and the Snake River basin in Idaho.

Each of the three AABM fisheries will be managed to achieve a specific harvest rate that varies based on an index of abundance of salmon present in that particular fishery for that particular year. Because each fishery is comprised of a different group of stocks that have different survival rates, the allowable catch will vary between fisheries and between years. Larger catches will be allowed when abundance is higher and, importantly, catches will be increasingly constrained when abundance is down. A schedule of harvest rates and abundance indices, and the resulting annual catch target, has been developed for each AABM fishery.

The ISBM fisheries generally occur in marine waters closer to the rivers of origin, or directly in the rivers. These fisheries often are aimed at harvesting hatchery-produced salmon or species other than chinook. The catch in these fisheries is comprised of a relatively small number of chinook stocks, some of which are currently depressed. Accordingly, these fisheries will fall under a "general obligation" that specifies certain reductions in exploitation rates relative to the "base period" (1979-1982).

The general obligation requires Canada to maintain at least a 36.5% reduction in fishing mortality on identified depressed chinook stock groups relative to the base period. The general obligation requires the US to maintain at least a 40% reduction relative to the same base period. In those cases where the general obligation is insufficient to achieve escapement objectives for natural stocks, additional reductions are specified.

The agreement provides a degree of flexibility to allow management agencies to decide how best to distribute the harvest impacts across their various fisheries to reflect domestic fishery priorities, provided the over-all reductions are achieved. For some chinook stocks, the total reductions will have to be much greater than the general obligation, due to the need to provide extra protection for certain very depressed stocks. The general obligation will not apply to hatchery stocks or healthy natural stocks that are achieving escapement objectives and can support harvest.

In addition to predetermined harvest schedules, the agreement contains provisions that specify conditions under which even greater harvest reductions will apply. These so-called "weak stock" provisions serve as a safety valve to afford additional protection to stocks that may fail to respond to the recovery program.

Fraser River Sockeye and Pink Salmon (Chapter 4). Although much of the structure of the previous agreements relating to the Fraser River is retained, the new agreement requires a reduction in the US share of Fraser sockeye. The reduction will be phased in over the next three years and completed by the 2002 fishing season. When completed, the US share in Washington State will be 16.5% of the total allowable catch.

The US share of Fraser pink salmon will be 25.7% of the total allowable catch.

Coho Salmon (Chapter 5). The coho agreement essentially provides a blueprint and specifications (biological criteria) for a conservation-based regime for border area fisheries in southern British Columbia and Washington State. The specifics of the regime will be co-operatively and bilaterally developed over the next year, in time to implement in 2000. The new regime will include rules that will establish harvest limits in specified border area fisheries. The rules will be designed to limit exploitation rates on natural coho stocks to sustainable levels, taking into account all fisheries affecting the stocks, thereby improving the long term prospects of sustainability, healthy fisheries in both countries.

For 1999, the parties will conduct their respective coho fisheries consistent with those that occurred in 1998.

Southern British Columbia and Washington State Chum Salmon (Chapter 6). This chapter incorporates certain refinements to the provisions that trigger fisheries directed at chum salmon in the Strait of Georgia and Puget Sound. These refinements will have only a minor impact on the allocation of catches, but will improve the effectiveness of the regime. Additionally, at the request of the US, Canada has agreed to require the live release of chum salmon in certain of its net fisheries in its southern boundary areas at those times of the year when "summer chum" - a species recently listed as "threatened" under the ESA - may be present in the area. Both countries agreed to collect better data relating to these fish.

II. Regional bilateral funds. The agreement establishes two funds which would be managed bilaterally and which would address science, restoration, and enhancement needs relating to salmon production. The Northern Boundary and Transboundary Rivers Restoration and Enhancement Fund ("Northern Fund") would address needs in northern and central British Columbia, southeast Alaska, and the Alsek, Taku and Stikine rivers. The Southern Boundary Restoration and Enhancement Fund ("Southern Fund") would address needs in southern British Columbia, the states of Washington and Oregon and the Snake River basin in Idaho.

The Northern and Southern funds would be constituted by an allocation of $75 million and $65 million dollars ($US), respectively, by the United States, provided over four years. Either country, as well as third parties, may contribute to the funds in the future upon agreement of the Parties.

For each of the regional funds, a bilateral committee composed of three representatives appointed by each of the two countries will be responsible for the approval of expenditure of moneys generated by the funds. Annual expenditures will not exceed the annual earnings from the invested principal of each of the funds; only the interest generated by the funds would be expended. Expenditures will be suspended upon the expiration of the relevant chapters of Annex IV, and may continue only after new fishing arrangements are agreed by the Parties.

The funds will be utilized for activities relating to the development of improved information for resource management (including data acquisition and improved scientific understanding of factors affecting salmon production); rehabilitation, restoration, and/or improvement of natural habitat to enhance the productive and protection of Pacific salmon; and enhancement of wild stock production using low-technology methods.

III. Renewed Cooperation on Scientific and Institutional Matters. The agreement includes a commitment by the two countries to improve how scientific information is obtained, shared, and applied to the management of the resource. Among other things, the agreement encourages staff exchanges between the management agencies, bilateral workgroups, and participation in the public domestic management processes of the other country.

Additionally, a new bilateral Committee on Scientific Cooperation has been established. To be comprised of up to eight persons nominated by the two national sections of the Pacific Salmon Commission (PSC), the Committee will be charged with assisting the Commission in setting its scientific agenda, advising on research and monitoring needs, and assisting in arranging peer review and evaluation of scientific reports.

The Commission also will be encouraged to resolve scientific issues through its various technical committees and asked to elaborate rules and procedures, as necessary, for the implementation of the process set out in Article XII of the Treaty for addressing technical disputes.

IV. Habitat. The agreement highlights the importance of habitat protection and restoration to achieving the long-term objectives of the Parties relative to salmon. While the primary focus of the agreement is on setting provisions that govern the management of fisheries, it is well understood that achieving optimum production of salmon will depend on other initiatives as well. These include, but are not limited to, maintaining adequate water quality and quantity, the achievement of improved spawning success and migration corridors for adult and juvenile salmon, and other measures that maintain and increase the production of natural stocks. The PSC will be directed to report annually to the Parties to identify stocks for which measures beyond harvest controls are required and the non-fishing factors that limit production, options for addressing these factors, and progress of the Parties in implementing measures to improve production.

Appendix D

Revised Annex I and Annex IV to the Pacific Salmon Treaty and attachments regarding Management of Northern Coho; Restoration and Enhancement Funds; Renewed Cooperation on Scientific and Institutional Matters; and Habitat and Restoration effective June 30, 1999

Annex IV

Chapter 1 Transboundary Rivers

The provisions of this Chapter shall apply for the period 1999 through 2008.

1. Recognizing the desirability of accurately determining exploitation rates and spawning escapement requirements of salmon originating in the transboundary rivers, the Parties shall maintain a joint Transboundary Technical Committee (the "Committee") reporting, unless otherwise agreed, to the Transboundary Panel and to the Commission. The Committee shall, *inter alia*,:

    (a) assemble and refine available information on migratory patterns, extent of exploitation and spawning escapement requirements of the stocks;

    (b) examine past and current management regimes and recommend how they may be better suited to achieving preliminary escapement goals; and

    (c) identify enhancement opportunities that:

        (i) assist the devising of harvest management strategies to increase benefits to fishermen with a view to permitting additional salmon to return to Canadian waters; and

        (ii) have an impact on natural transboundary river salmon production.

2. The Parties shall improve procedures for coordinated or cooperative management of the fisheries on transboundary river stocks. To this end, the Parties affirm their intent to develop and implement abundance-based management regimes for transboundary chinook, sockeye and coho salmon no later than May 1, 2004.

3. Recognizing the objectives of each Party to have viable fisheries, the Parties agree that the following arrangements shall apply to the United States and Canadian fisheries harvesting salmon stocks originating in the Canadian portion of:

    (a) the Stikine River:
    (1) Sockeye Salmon:

        (i) Assessment of the annual run of Stikine River sockeye salmon shall be made as follows:

a. a pre-season forecast of the Stikine River sockeye run will be made by the Committee prior to April 1 of each year. This forecast may be modified by the Committee prior to the opening of the fishing season;

b. in-season estimates of the Stikine River sockeye run and the Total Allowable Catch (TAC) shall be made under the guidelines of an agreed Stikine Management Plan and using a forecast model developed by the Committee. Both U.S. and Canadian fishing patterns shall be based on current weekly estimates of the TAC. At the beginning of the season and up to an agreed date, the weekly estimates of the TAC shall be determined from the pre-season forecast of the run strength. After that date, the TAC shall be determined from the in-season forecast model;

c. modifications to the Stikine Management Plan and forecast model may be made prior to June 1 of each year by agreement of both Parties. Failure to reach agreement in modifications shall result in use of the model and parameters used in the previous year; and

d. estimates of the TAC may be adjusted in-season only by concurrence of both Parties' respective managers. Reasons for such adjustments must be provided to the Committee.

(ii) The Parties desire to maximize the harvest of Tahltan/Tuya sockeye salmon in their existing fisheries while considering the conservation needs of wild salmon runs. The Parties agree to manage the returns of Stikine River sockeye to ensure that each country obtains 50% of the TAC in their existing fisheries. Canada will endeavour to harvest all of the fish surplus to escapement and broodstock needs returning to the Tuya and Tahltan Lake systems.

(iii) The Parties agree to continue the existing joint enhancement programs designed to produce annually 100,000 returning sockeye salmon.

(2) Coho salmon:

(i) Consistent with paragraph 2 above, the Parties agree to develop and implement an abundance-based approach to managing coho salmon on the Stikine River. Assessment programs need to be further developed before a MSY escapement goal can be established.

(ii) In the interim, the United States' management intent is to ensure that sufficient coho salmon enter the Canadian section of the Stikine River to meet the agreed spawning objective, plus an annual Canadian catch of 4,000 coho salmon in a directed coho salmon fishery.

(3) Chinook salmon:

(i) Both Parties shall take the appropriate management action to ensure that the necessary escapement goals for chinook salmon bound for the Canadian portions of the Stikine River are achieved.

(ii) The Parties agree that new fisheries on Stikine River chinook salmon will not be developed without the consent of both Parties. Consistent with paragraph 2, management of new directed fisheries will be abundance-based through an approach to be developed by the Committee. The Parties agree to implement assessment programs in support of the development of an abundance-based management regime.
(iii) The Parties shall review an appropriate MSY escapement goal for Stikine River chinook by May 1999 and establish a new goal as soon as practicable thereafter.

(b) the Taku River:
(1) Sockeye salmon:

(i) Except as noted below, Canada shall harvest no more than 18% of the TAC of the wild sockeye salmon originating in the Canadian portion of the Taku River each year.

(ii) If the projected in-river escapement is greater than 100,000 sockeye, Canada may, in addition, harvest 20% of the projected in-river escapement above 100,000 sockeye.

(iii) The Parties agree to manage the returns of Taku River sockeye to ensure that each country obtains catches in their existing fisheries equivalent to each country's share of wild sockeye and a 50% share of enhanced sockeye.

(iv) The Parties agree to continue the existing joint Taku enhancement program designed to produce annually 100,000 returning sockeye salmon.

(2) Coho salmon:

(i) Consistent with paragraph 2 above, the Parties agree to develop and implement an abundance-based approach to managing coho salmon on the Taku River. The Parties commit to developing a revised MSY escapement goal to be implemented no later than May 1, 2004.

(ii) Until a new abundance-based approach is developed, the management intent of the United States is to ensure a minimum above-border in-river run of 38,000 coho salmon, and the following arrangements will apply:

a. no numerical limit on the Taku River coho catch will apply in Canada during the directed sockeye salmon fishery (through statistical week 33);

b. if in-season projections of above-border run size are less than 50,000 coho salmon, a directed Canadian harvest of up to 3,000 coho salmon is allowed for assessment purposes as part of the joint Canada/U.S. Taku River mark-recapture program;

c. if in-season projections of above-border run size exceed 50,000 coho salmon, a directed Canadian harvest of 5,000 coho salmon is allowed;

d. if in-season projections of above-border run size exceed 60,000 coho salmon, a directed Canadian harvest of 7,500 coho salmon is allowed; and

e. if in-season projections of above border run size exceed 75,000 coho salmon, a directed Canadian harvest of 10,000 coho is allowed.

(3) Chinook salmon:

(i) Both Parties shall take the appropriate management action to ensure that the necessary escapement goals for chinook salmon bound for the Canadian portions of the Taku River are achieved.

(ii) The Parties agree that new fisheries on Taku River chinook salmon will not be developed without the consent of both Parties. Consistent with paragraph 2 above, management of new directed fisheries will be abundance-based through an approach to be developed by the Committee. The Parties agree to implement assessment programs in support of the development of an abundance-based management regime.

(iii) The Parties shall review an appropriate MSY escapement goal for Taku River chinook by May 1999 and thereafter establish a new goal as soon as practicable.

(c) the Alsek River:

(i) Consistent with paragraph 2 above, the Parties will develop and implement cooperative abundance-based management programs for Alsek River chinook, sockeye and coho salmon, including MSY escapement and management goals for chinook and sockeye salmon.

(ii) The Committee will be responsible for developing and reporting to the Commission by May 1, an annual pre-season fishery management plan for Alsek River fisheries.

4. The Parties agree that if catch allocations set out for transboundary river salmon are not attained due to management actions by either Party in any one year, compensatory adjustment shall be made in subsequent years. If a shortfall in the actual catch of a Party is caused by management action of that Party, no compensation shall be made. The Parties agree that midway through the Chapter period the harvest sharing performance will be evaluated and adjustments made over the remainder of the Chapter period, if necessary. At the end of the Chapter period, cumulative overages or underages will be carried forward to the next Chapter period.

5. The Parties agree that midway through the Chapter period, or other agreed time, they will review the current Chapter and may determine if they want to renew the Chapter for an additional period of time.

6. Consistent with paragraph 2 above, the Parties agree to develop and implement abundance-based fishery regimes for Taku and Stikine River chinook and coho salmon. Once bilaterally agreed MSY escapement objectives and in-season stock assessment programs are established, the Parties agree to examine their respective abilities to access enhanced sockeye salmon and re-examine harvest sharing arrangements for chinook, sockeye and coho salmon.

7. The Parties agree to consider cooperative enhancement possibilities and to undertake, as soon as possible, studies on the feasibility of new enhancement projects on the transboundary rivers and adjacent areas for the purpose of increasing productivity of stocks and providing greater harvests to the fishermen of both countries.

8. Recognizing that stocks of salmon originating in Canadian sections of the Columbia River constitute a small portion of the total populations of Columbia River salmon, and that the arrangements for consultation and recommendation of escapement targets and approval of enhancement activities set out in Article VII are not appropriate to the Columbia River system as a whole, the Parties consider it important to ensure effective conservation of up-river stocks which extend into Canada and to explore the development of mutually beneficial enhancement activities. Therefore, notwithstanding Article VII, paragraphs 2, 3, and 4, the Parties shall consult with a view to developing, for the transboundary sections of the Columbia River, a more practicable arrangement for consultation and setting escapement targets than those specified in Article VII, paragraphs 2 and 3. Such arrangements will seek to, *inter alia*,:

(a) ensure effective conservation of the stocks;

(b) facilitate future enhancement of the stocks on an agreed basis; and

(c) avoid interference with United States management programs on the salmon stocks existing in the non-transboundary tributaries and the main stem of the Columbia River.

Appendix to Annex IV, Chapter 1
Understanding on the Joint Enhancement of Transboundary River Sockeye Stocks

Pursuant to Annex IV of the Pacific Salmon Treaty, and recognizing the desire of Canada and the United States to continue a joint enhancement program for the transboundary rivers that is carefully planned and coordinated:

1. The Parties agree:

    (a) to continue to develop strategies for management of the enhanced stocks prior to the return of adult fish;

    (b) to continue to develop an agreed process for conducting periodic review of implemented projects to identify and recommend action regarding, *inter alia*:

        (i) success or failure of a project in a given year or series of years;

        (ii) a distribution of benefits that is substantially different than expected; and

        (iii) costs which are substantially greater than expected; and

    (c) to recommend a plan, when required, for funding of projects including:

        (i) cost sharing arrangements between the Parties; and

        (ii) long term funding obligations.

2. The Parties agree to maintain an Enhancement Subcommittee of the joint Transboundary Technical Committee whose Terms of Reference shall be, *inter alia*, to:

    (a) develop preliminary summaries of various projects which meet the enhancement goals established by the Transboundary Panel;

    (b) develop detailed feasibility studies for projects selected by the Transboundary Panel, including:

        (i) estimation of costs and benefits;

        (ii) likelihood of success;

        (iii) schedules for implementation;

        (iv) procedures for evaluation; and

        (v) fisheries management plans for the enhanced stocks; and

    (c) monitor implementation of projects and report progress to the Transboundary Panel.

3. Project Selection:

(a) General Guidelines:

(i) If broodstock is not available to provide the agreed number of eggs, up to 30% of the available adults will be taken, provided that a minimum of 600,000 eggs are available; if this minimum number is not available, no eggs will be taken;

(ii) A reasonable expectation that a stock identification technique will be available to estimate the contribution of enhanced sockeye in mixed stock fisheries is required in order for these projects to proceed. The appropriate stock identification technique for each fishery will be determined by the joint Transboundary Technical Committee.

(b) Stikine River:

For the duration of this Chapter, the eggtake goal for the Stikine sockeye enhancement program will be six million eggs. The Tahltan Lake sockeye salmon stock will be used as the source of eggs. Eggs will be incubated at the Port Snettisham central incubation facility (CIF). Fry will be planted into Tahltan and Tuya Lakes in the following manner, subject to review by the joint Transboundary Technical Committee:

(a) When the sockeye escapement through the Tahltan Lake weir is less than 15,000 fish or an agreed alternate threshold, all fry will be returned to Tahltan Lake;

(b) When the sockeye escapement through the Tahltan Lake weir is greater than 15,000 fish or an agreed alternate threshold, the fry will be distributed to Tahltan and Tuya Lakes in a manner which maximises harvestable production and provides information on the potential production capacity of Tuya Lake.

(c) Taku River:

For the duration of this Chapter, the eggtake goal for the Taku sockeye enhancement program will be five million eggs. The Tatsamenie Lake salmon stock will be used as the source of eggs. Eggs will be incubated at the Port Snettisham central incubation facility (CIF). Fry will be planted into Tatsamenie Lake.

4. Harvest principles and cost sharing:

(a) The Parties desire to maximize the harvest of enhanced sockeye salmon in their existing fisheries while considering the conservation needs of wild salmon runs. To avoid impacts on co-migrating stocks and species, exploitation rates applied to Taku and Stikine river sockeye salmon in existing mixed stock fisheries in Canada and the United States shall be at levels compatible with the maintenance of wild stocks.

(b) Harvest sharing arrangements for enhanced stocks will be determined prior to the time eggs are taken to initiate production level enhancement.

5. Cost sharing:

(a) In carrying out joint enhancement projects, capital construction and on-site operating costs shall be borne by the country on whose soil the project components are located.

(b) The costs of producing Stikine River enhanced sockeye salmon shall be shared as follows:

(i) To be paid by Canada:
    a. Egg take;
    b. Egg transport;
    c. Smolt sampling;
    d. Sampling and numerical analysis necessary to determine the contribution of enhanced transboundary river sockeye salmon to Canadian fisheries; and
    e. Limnology sampling and hydroacoustics.

(ii) To be paid by the United States:
    a. Construction and operation of that portion of the Port Snettisham CIF that is dedicated to enhancement projects on the transboundary rivers.
    b. Transport of fry to enhancement site; and
    c. Sampling and analysis necessary to determine the contribution of enhanced transboundary river sockeye salmon to United States fisheries.

(iii) Projects to be conducted jointly:
    a. Disease sampling and analysis.

(c) The costs of producing Taku River enhanced sockeye salmon shall be shared as follows:

(i) To be paid by Canada:
    a. Egg take;
    b. Egg transport;
    c. Smolt sampling;
    d. Sampling and numerical analysis necessary to determine the contribution of enhanced Taku River sockeye stocks to Canadian fisheries;
    e. Limnology sampling and hydroacoustics; and
    f. Investigations to determine the feasibility of using sockeye from terminal areas, surplus to brood stock and spawning requirements in enhanced systems, for cost recovery.

(ii) To be paid by the United States:
    a. Construction and operation of that portion of the Port Snettisham CIF that is dedicated to enhancement projects on the transboundary rivers;
    b. Transport of fry to the enhancement site;
    c. Sampling and analysis necessary to determine the contribution of enhanced transboundary river sockeye salmon to United States fisheries; and
    d. Processing of sockeye otolith samples collected in the Taku River.

(iii) Projects to be conducted jointly:
    a. Disease sampling and analysis; and
    b. Identification and evaluation of alternative sockeye salmon enhancement opportunities in the Taku River.

Chapter 2 Northern British Columbia and Southeastern Alaska

The provisions of this Chapter shall apply for the period 1999 through 2008.

1. With respect to the Portland Canal chum salmon fishery, neither Party shall conduct net fisheries in U.S. District 1A and Canadian sub-areas 3-15 and 3-16 nor conduct directed chum fisheries in U.S. District 1B north and east of Akeku Point or in Canadian sub-areas 3-11 and 3-13 unless agreed otherwise by the Parties.

2. With respect to sockeye salmon, the United States shall

    (a) manage the Alaskan District 104 purse seine fishery prior to statistical week 31 to:

        (i) achieve an annual catch share of Nass and Skeena sockeye of 2.45 percent of the Annual Allowable Harvest (AAH) of the Nass and Skeena sockeye stocks in that year. The methodology for AAH calculations is provided in the Appendix to this Chapter.

        (ii) carry forward from year to year annual deviations from the prescribed catch share arrangement in (i). Details of the procedure are outlined in the Appendix to this Chapter.

    (b) manage the Alaskan District 101 drift gillnet fishery to:

        (i) achieve an annual catch share of Nass sockeye of 13.8 percent of the AAH of the Nass sockeye stocks in that year. The methodology for AAH calculations is provided in the Appendix to this Chapter.

        (ii) carry forward from year to year annual deviations from the prescribed catch share arrangement in (i). Details of the procedure are outlined in the Appendix to this Chapter.

3. With respect to pink salmon, Canada shall

    (a) manage the Canadian Area 3-1, 3-2, 3-3 and 3-4 net fishery to:

        (i) achieve an annual catch share of 2.49 percent of the AAH of Alaskan Districts 101, 102 and 103 pink salmon in that year. The methodology for AAH calculations is provided in the Appendix to this Chapter.

        (ii) carry forward from year to year annual deviations from the prescribed catch share arrangement in (i). Details of the procedure are outlined in the Appendix to this Chapter.

    (b) manage the Canadian Area 1 troll fishery to:

        (i) achieve an annual catch share of 2.57 percent of the AAH of Alaskan Districts 101, 102 and 103 pink salmon in that year. The methodology for AAH calculations is provided in the Appendix to this Chapter.

        (ii) carry forward from year to year annual deviations from the prescribed catch share arrangement in (i). Details of the procedure are outlined in the Appendix to this Chapter.

4. In order to accomplish the objectives of this Chapter, neither Party shall initiate new intercepting fisheries, nor conduct or redirect fisheries in a manner that intentionally increases interceptions.

5. The Parties shall maintain a joint Northern Boundary Technical Committee (the "Committee") reporting, unless otherwise agreed, to the Northern Panel and the Commission. The Committee shall, *inter alia*,:

(a) evaluate the effectiveness of management actions;

(b) identify and review the status of pink, chum, sockeye and coho stocks;

(c) present the most current information on harvest rates and patterns on these stocks, and develop a joint data base for assessments;

(d) collate available information on the productivity of stocks in order to identify escapements which produce maximum sustainable harvests and allowable harvest rates;

(e) present historical catch data, associated fishing regimes, and information on stock composition in fisheries harvesting these stocks;

(f) devise analytical methods for the development of alternative regulatory and production strategies;

(g) identify information and research needs, including future monitoring programs for stock assessments; and

(h) for each season, make stock and fishery assessments and recommend to the Northern Panel conservation measures consistent with the principles of the Treaty.

Appendix to Annex IV, Chapter 2
Understanding on the Application of Annex IV, Chapter 2
(Northern British Columbia and Southeastern Alaska)

1. Annual Allowable Harvest ("AAH")

(a) Combined Nass and Skeena Sockeye AAH for Alaska District 104 Purse Seine Fishery

The AAH each year will be calculated as the combined total run of adult Nass and Skeena sockeye salmon in that year less the combined Nass and Skeena escapement target of 1.1 million fish. In the event that the actual Nass and Skeena spawning escapement for the season is below the target level, the actual spawning escapement will be used in the AAH calculation.

The total run calculation includes the catches of Nass and Skeena sockeye salmon in the principal boundary area fisheries and the spawning escapements to the Nass and Skeena watersheds. This includes the catch of Nass and Skeena sockeye salmon in: Alaskan Districts 101, 102, 103, 104 and 106 net fisheries; Canadian Areas 1, 3, 4 and 5 net fisheries; and Canadian Nass and Skeena in-river fisheries. Catches in other boundary area fisheries may be included as jointly agreed by the Northern Boundary Technical Committee.

(b) Nass Sockeye AAH for Alaska District 101 Drift Gillnet Fishery

The AAH each year will be calculated as the total run of adult Nass sockeye in that year less the escapement target of 0.2 million fish. In the event that the actual Nass spawning escapement for the season is below the target level, the actual spawning escapement will be used in the AAH calculation.

The total run calculation includes the catches of Nass sockeye salmon in the principal boundary area fisheries and the spawning escapement to the Nass watershed. This includes the catch of Nass sockeye salmon in: Alaskan Districts 101, 102, 103, 104 and 106 net fisheries; Canadian Areas 1, 3, 4, and 5 net fisheries; and Canadian Nass in-river fisheries. Catches in other boundary area fisheries may be included as jointly agreed by the Northern Boundary Technical Committee.

(c) Districts 101, 102 and 103 Pink Salmon AAH for Canadian Area 3(1-4) Net and Area 1 Troll Fisheries

The AAH in each year will be calculated as the total run of adult pink salmon to Alaskan Districts 101, 102 and 103 in that year less the minimum escapement target of 10.75 million fish. In the event that the actual escapement for the season is below the target level, the actual escapement will be used in the AAH calculation.

The total pink salmon run to Alaskan Districts 101, 102 and 103 will be calculated as the catch of Alaskan pink salmon in: Canadian Areas 1, 3, 4 and 5 net and troll fisheries; Alaskan Districts 101, 102, 103 and 104 net and troll fisheries; and in the escapements to Districts 101, 102 and 103.

2. Exchange of Management and Stock Assessment Information

(a) Pre-season

Pre-season estimates of the AAHs will be provided through the Northern Boundary Technical Committee by May 1 of each year.

(b) In-season

The Parties will exchange management and assessment information in-season. The exchange will occur weekly (or more often if required) and include (but not be limited to) catch, catch per unit effort, escapement and run size estimations.

(c) Post-season

The calculation of the allowable and actual harvests of salmon, as specified in Annex IV, Chapter 2, shall be determined by the Northern Boundary Technical Committee (prior to January 31 of the following year unless otherwise agreed) using the current agreed post-season accounting methodology. These methods are expected to change as improved techniques or assessments become available. Any new jointly agreed method will be used from that point onward in Northern Boundary Technical Committee post-season accounting. These new techniques or assessments could include (but would not be limited to) changes to escapement targets, stock identification methods and reconstruction models. Any new techniques or assessments will not be used to alter the Annex IV, Chapter 2, AAH shares, or to recalculate previous years where the accounting has been finalized.

3. Overage and underage provisions for the Annex IV, Chapter 2, paragraphs 2 and 3 (sockeye and pink salmon).

(a) The intent of the overage/underage provision is to provide an arrangement where the Parties are accountable for catch shares but have flexibility in their management of fisheries subject to the Treaty

(b) Although the management intent shall be to harvest salmon at the allowable percentage AAH, it is recognized that overages and underages will occur and an accounting mechanism is required.

(c) The payback mechanism for each fishery will be based on the number of fish and use the agreed-upon accounting method.

(d) After each season, the calculation of the allowable and actual harvests of salmon as specified in Annex IV, Chapter 2, shall be determined by the agreed post-season accounting methodology. If the actual harvest deviates from the allowable harvest as stipulated in the Annex, the deviation is added to any cumulative deviation.

(e) The management intent for each fishery shall be to return any overages to a neutral or negative balance as soon as possible. After five years of consecutive overages, the Party with the cumulated overage must provide the Northern Panel with specific management actions that will eliminate the overage in that fishery.

4. Unless mutually agreed, the accrual of underages is not intended to allow a Party to modify its fishing behavior in any given year to harvest the total accrued underage. Parties shall manage with the intent to harvest no more than 150 percent of their AAH in any season.

5. The Parties agree to review Annex IV, Chapter 2, a minimum of two years prior to its expiration with a view to renewing it. If such renewal is not successfully concluded prior to the expiration date, then overages and underages must be carried forward to the next Chapter period.

Chapter 3 Chinook Salmon

The provisions of this Chapter shall apply for the period 1999 through 2008.

1) The Parties shall:

(a) establish a chinook management program that meets the following objectives:

(i) provides a long-term abundance-based framework for managing all chinook fisheries subject to the Treaty;

(ii) introduces harvest regimes that are based on estimates of chinook abundance, that are responsive to changes in chinook production, that take into account all fishery induced mortalities and that are designed to meet MSY or other agreed biologically-based escapement objectives;

(iii) halts the decline in spawning escapements in depressed chinook salmon stocks;

(iv) sustains healthy stocks and rebuilds stocks that have yet to achieve MSY or other biologically-based escapement objectives;

(v) defines the specific obligations of all the various fisheries in maintaining healthy chinook salmon stocks, rebuilding depressed naturally spawning chinook stocks that are not meeting escapement objectives and providing a means for sharing the harvest and the conservation responsibility for chinook stocks coastwide among the Parties; and,

(vi) develops biological information pursuant to an agreed program of work and incorporates that information into the coastwide management regime;

(b) maintain a joint Chinook Technical Committee (the "CTC") reporting unless otherwise agreed, to the Pacific Salmon Commission (the "Commission"), which shall, *inter alia*,:

(i) evaluate management actions for their consistency with measures set out in this Chapter, and for their potential effectiveness in attaining the specified objectives;

(ii) report annually on catches, harvest indices, estimates of incidental mortality and exploitation rates for all chinook fisheries and stocks harvested within the Treaty area;

(iii) report annually on the escapement of naturally spawning chinook stocks in relation to the agreed escapement objectives referred to below, evaluate trends in the status of stocks and report on progress in the rebuilding of naturally spawning chinook stocks;

(iv) evaluate and review existing escapement objectives that fishery management agencies have set for chinook stocks subject to this Chapter for consistency with MSY or other agreed biologically-based escapement goals and, where needed, recommend goals for naturally spawning chinook stocks that are consistent with the intent of this Chapter;

(v) recommend standards for the minimum assessment program required to effectively implement this Chapter, provide information on stock assessments relative to these standards and recommend to the Commission any needed improvements in stock assessments;

(vi) review effects of enhancement programs on abundance-based management regimes and recommend strategies for the effective utilization of enhanced stocks;

(vii) recommend research projects, and their associated costs, required to implement this Chapter effectively;

(viii) exchange information necessary to analyze the effectiveness of alternative fishery regulatory measures to satisfy conservation objectives; and,

(ix) undertake specific assignments such as those described in the Appendix to this Chapter.

2. The Parties agree to implement, beginning in 1999 and extending through 2008, an abundance-based coastwide chinook management regime to meet the objectives set forth in paragraph 1 (a) above, under which fishery regimes shall be classified as aggregate abundance-based management regimes ("AABM") or individual stock-based management regimes ("ISBM"):

(a) an AABM fishery is an abundance-based regime that constrains catch or total adult equivalent mortality to a numerical limit computed from either a pre-season forecast or an in-season estimate of abundance, and the application of a desired harvest rate index expressed as a proportion of the 1979-82 base period. The following regimes will be managed under an AABM regime:

(i) southeast Alaska sport, net and troll;

(ii) Northern British Columbia (NBC) troll (statistical areas 1-5) and Queen Charlotte Islands (QCI) sport (statistical areas 1 and 2); and

(iii) west coast of Vancouver Island (WCVI) troll (statistical areas 21, 23-27, and 121-127) and outside sport.[3]

(b) an ISBM fishery is an abundance-based regime that constrains to a numerical limit the total catch or the total adult equivalent mortality rate within the fisheries of a jurisdiction for a naturally spawning chinook stock or stock group. ISBM management regimes apply to all chinook fisheries subject to the Treaty that are not AABM fisheries. The obligations applicable to ISBM fisheries are:

(i) a general obligation as set out in paragraph 4 (d) for all ISBM fisheries which include, but are not necessarily limited to: northern British Columbia marine net and coastal sport (excluding Queen Charlotte Islands), and freshwater sport and net; central British Columbia marine net, sport and troll and freshwater sport and net; southern British Columbia marine net, troll and sport and freshwater sport and net; West Coast of Vancouver Island inside marine sport and net and freshwater sport and net; south Puget Sound marine net and sport and freshwater sport and net; north Puget Sound marine net and sport and freshwater sport and net; Juan de Fuca marine net, troll and sport and freshwater sport and net; Washington Coastal marine net, troll and sport and freshwater sport and net; Washington Ocean marine troll and sport; Columbia River net and sport; Oregon marine net, sport and troll; Idaho (Snake River Basin) freshwater sport and net; and

---

[3] The part of the West Coast Vancouver Island chinook sport fishery included in the WCVI AABM chinook fishery includes:

- Areas 21, 23, 24 inside the Canadian "surfline" and Areas 121, 123, 124 during the period October 16 through July 31, plus that portion of Areas 21, 121, 123, 124 outside of a line generally one nautical mile seaward from the shoreline or existing Department of Fisheries and Oceans surfline, during the period August 1 through October 15.
- Area 25, 26, 27 inside the Canadian "surfline" and Areas 125, 126, 127 during the period October 16 through June 30, plus that portion of Area 125, 126, 127 outside of a line generally one nautical mile seaward from the shoreline or existing Department of Fisheries and Oceans surfline, for the period July 1 through October 15.

(ii) an additional obligation as set out in paragraph 4 (e) for those stock groups for which the general obligation is insufficient to meet the agreed escapement objectives.

3. The Parties agree:

(a) to adopt a management framework for chinook salmon based on total fishing mortality;

(b) that, because significant uncertainty presently exists in predicting and estimating incidental mortality, the adoption of fishery regimes based on total mortality will require improvements in estimates of incidental mortality based upon direct fishery observations;

(c) that a total fishing mortality approach will be implemented as soon as the required technical improvements in predictions and estimates of incidental mortality can be made. The intent of the Parties is that such an approach be adopted for all fisheries by 2002 if possible;

(d) that during the interim period, enhancements to the catch-based regimes as noted in the CTC Report TCChinook (98)-1 (December 2, 1998) will be adopted as follows:

(i) beginning in 2000, total adult equivalent fishing mortality in each AABM fishery shall be constrained by expressing the fishery management objective as a target catch index and a standardized management regime (e.g., minimum size limit of *x*, ratio of encounters in chinook retention to chinook non-retention periods not to exceed *y*). Each fishery will be managed in a manner consistent with the standardized management regime for that fishery;

(ii) beginning in 2000, in those AABM fisheries where the CTC has determined that an accurate, consistent and verifiable relationship exists between the catch index and the total adult equivalent mortality index, total fishing mortality will be constrained by expressing the fishery management objective as a target catch index that has been derived from an agreed fishery harvest rate, where the total adult equivalent mortality index cannot exceed the target catch index by more than the average percentage differences observed during the period 1985-95. Such an amount will be fishery specific;

(e) as an incentive to reduce incidental mortalities, the Parties may submit to the Commission for review, modifications to the standardized fishing regimes pursuant to paragraph 3 (d) believed to result in reductions to incidental mortalities in an AABM fishery. Following review and evaluation by the CTC pursuant to paragraph 3 (d) (ii), 50% of the reductions in the adult equivalent incidental mortalities attributed to the modification can be added to the allowable catch for the AABM fishery.

4. The Parties agree that in respect of ISBM fisheries:

(a) their intent is that the fisheries shall be managed over time to contribute to the achievement of MSY or other agreed biologically-based escapement objectives;

(b) until such times as the ISBM fisheries are managed to meet those escapement objectives, and unless otherwise recommended by the CTC, the non-ceiling index defined in TCChinook (96)-1 (February 15, 1996) will be used to measure performance of ISBM fisheries;

(c) the non-ceiling index for ISBM fisheries will be computed pre-season based on forecasted abundance and fishing plans and evaluated post season for each of the escapement indicator stocks listed in Attachments I to V to this Chapter;

(d) for the purposes of this paragraph, until agreed escapement objectives for the stock groups listed in Attachments I to V to this Chapter have been achieved, Canada and the United States shall reduce by 36.5 percent and 40 percent respectively, the total adult equivalent mortality rate, relative to the 1979-82 base period[4], in their respective ISBM fisheries that affect those stock groups. The reduction identified in this sub-paragraph shall be referred to as the "general obligation";

(e) for those stock groups for which the general obligation is insufficient to meet the agreed escapement objectives, the jurisdiction within which the stock group originates shall implement either:

(i) additional reductions as necessary to meet the agreed escapement objectives; or

(ii) additional reductions, which taken together with the general obligation, are at least equivalent to the average of those reductions that occurred for the stock group during the years 1991-96; and

(f) the reductions in ISBM fisheries may be allocated among fisheries within a jurisdiction provided that:

(i) the obligations under sub-paragraphs (d) and (e) above are met;

(ii) the achievement of the agreed escapement objective for other stocks or stock groups is not adversely affected; and

(iii) the harvest impacts are not transferred among fisheries in a manner that results in the additional restrictions, pursuant to paragraph 9, in the ISBM or AABM fisheries in another jurisdiction.

5. The Parties agree that:

(a) the graduated harvest rate approach specified in paragraph 6 shall be used in AABM fisheries and is designed to contribute to the achievement of MSY or other agreed biologically-based escapement objectives;

---

[4] Assuming size limits in effect during 1991-1996.

(b) the graduated harvest rate approach is based on a relationship between the aggregate abundance of chinook stocks available to the fishery and a specified harvest rate index;

(c) AABM fisheries shall be managed annually to achieve the fisheries harvest rate index value designated for the applicable abundance index value as described in paragraph 6 below;

(d) the allowable harvest level in an AABM fishery shall be based upon the best available pre-season predictions of abundance as determined by the CTC; and

(e) where, as determined by the CTC, in-season predictors provide a more reliable prediction of the abundance than pre-season indicators alone, in-season adjustments of pre-season catch estimates shall be permitted. In such circumstances, pre-season catch estimates shall be adjusted by incorporating in-season estimates of abundance. The CTC has reviewed an in-season predictor for abundance of the chinook salmon in the SEAK troll fishery and concluded that the Bayesian method that incorporates both pre-season and in-season catch estimates based on approved in-season fishery performance data, is permitted.

6. The Parties agree that:

(a) indices identified in this paragraph are consistent with CTC analyses through May 1999. In the event that subsequent analyses modify these values, the historical relationship between catch and abundance indices will be maintained;

(b) beginning in 1999, management of the SEAK troll, net, and sport fisheries for chinook salmon shall be based on the relationship between the aggregate abundance of chinook stocks available to the SEAK troll fishery and an appropriate harvest rate index. The combined SEAK troll plus sport and net catch shall be constrained by a specified relation or formula. Unless otherwise agreed, the chinook catch in the SEAK troll, sport, and net fisheries shall be managed annually according to catch and abundance indices stated in Table 1;

(c) beginning in 1999, management of the NBC troll and QCI sport fisheries for chinook salmon shall be based on the relationship between the aggregate abundance of chinook stocks available to the NBC troll fishery and an appropriate harvest rate index. The combined NBC troll plus QCI sport catch shall be constrained by a specified relation or formula. Unless otherwise agreed, the chinook catch in the NBC troll and QCI sport fisheries shall be managed annually according to catch and abundance indices stated in Table 1, and;

(d) beginning in 1999, management of the WCVI troll and outside sport fisheries for chinook salmon shall be based on the relationship between the aggregate abundance of chinook stocks available to the WCVI troll fishery and an appropriate harvest rate index. The combined WCVI troll plus outside sport catch shall be constrained by a specified relation or formula. Unless otherwise agreed, the chinook catch in the WCVI troll and outside sport fisheries shall be managed annually according to catch and abundance indices stated in Table 1.

7. The Parties agree that, beginning in 1999, provisions for overage and underage shall be developed by the CTC as follows:

(a) in AABM fisheries:

(i) the first post-season CTC model calibration will be used to compute the abundance index;

(ii) a cumulative (across years) management range of 7.5 percent (subject to review by the CTC) shall be permitted;

(iii) underages in excess of the management range in sub-paragraph (ii) above cannot be accumulated; and

(iv) total mortality will be incorporated pursuant to paragraph 3.

(b) in ISBM fisheries:

(i) consistency with the index applicable to ISBM fisheries pursuant to paragraph 4 will be assessed when the exploitation rate analysis for that year's fishery is completed;

(ii) a cumulative (across years) overage of 7.5 percent (subject to review by the CTC) of the ISBM index shall be permitted;

(iii) underages in excess of the management range in sub-paragraph (ii) above cannot be accumulated; and

(iv) overages in ISBM fisheries for a stock group are to be assessed in aggregate over all of the Party's ISBM fisheries and any overages shall be adjusted within the jurisdiction's fisheries with the obligation that:

(1) achievement of agreed escapement objectives for other stocks or stock groups is not adversely affected; and

(2) harvest impacts are not transferred among fisheries in a manner that results in additional restrictions pursuant to paragraph 9 in the ISBM or AABM fisheries in another jurisdiction.

8. The Parties agree:

(a) to continue the procedures previously established by the Commission to allow for the exclusion of chinook salmon catches in selected terminal areas from counting against Treaty catch limitations; and

(b) to continue the procedures previously established by the Commission to allow for hatchery add-ons harvested in AABM fisheries.

9. The Parties agree that:

(a) the fishery harvest rate responses or other management actions outlined in sub-paragraphs (b) and (c) below, which are intended to return escapements as expeditiously as possible to MSY or other agreed biologically-based escapement objectives, and notwithstanding the provisions of paragraphs 4 and 6, shall only be implemented in ISBM and AABM fisheries in respect of those stocks for which the CTC review has been completed and agreed escapement objectives have been determined, when:

(i) beginning in 1999, if naturally spawning chinook stocks or stock groups listed in Attachments I - V to this Chapter are below the agreed escapement objectives for two consecutive years;

(ii) escapement of the stock or stock group would be increased by the adjustment;

(iii) there is a contributing causal relationship between the fishery harvest and the status of the stock or stock group, or the decline in the stock or stock group is due to natural phenomena; and

(iv) complementary and coordinated management actions are taken in other directed marine and freshwater chinook fisheries affecting the stock or stock group in accordance with (d) and (e) below;

(b) the additional management actions to be taken in relevant fisheries in accordance with this paragraph are as follows:[5]

Percentage reduction in index[6]	**Number of stock groups requiring response**
10%	2 stock groups
20%	3 stock groups
30%	4+ stock groups

(c) the Parties may take other management actions as may be agreed by the Commission, such as time and area restrictions, which have comparable conservation benefits as identified in sub-paragraph (b) above;

(d) the measures specified in sub-paragraph (b) or (c) above apply to an AABM fishery when the provisions of sub-paragraph (a) above have been met, and:

(i) the obligation identified in paragraph 4 for ISBM fisheries has been complied with in all ISBM fisheries that affect the stock or stock group for two consecutive years that the stock or stock group has not achieved agreed biologically-based escapement objectives; and

(ii) the obligation identified in paragraph 6 for AABM fisheries has been complied with in all other AABM fisheries that affect the stock or stock group for two consecutive years that the stocks or stock groups have not achieved agreed biologically-based escapement objectives;

---

[5] A stock group should be considered for additional management action pursuant to this paragraph if a significant loss of production results from escapement less than the agreed escapement objective for an extended period of time. By the end of 2001, the CTC will recommend, for adoption by the Commission, criteria defining the lower bound of escapement for the purposes of taking additional management actions pursuant to this paragraph. Until the end of 2001, the escapement level at which the MSY production is reduced by more than 15% will be defined as the lower bound for escapement.

[6] The index that applies to ISBM fisheries is described in paragraph 4; the index that applies to AABM fisheries is described in paragraph 6.

(e) the measures specified in sub-paragraphs (b) and (c) above apply to an ISBM fishery when the provisions of sub-paragraph (a) have been met, and:

(i) the obligation identified in paragraph 4 for ISBM fisheries has been complied with in all other ISBM fisheries that affect the stock or stock group for two consecutive years that the stock or stock group has not achieved agreed biologically-based escapement objectives; or

(ii) the measures specified in sub-paragraph (b) or (c) are being implemented in an AABM fishery that affects the stock or stock group;

(f) where, on the basis of a pre-season forecast of abundance, it is bilaterally agreed that, due to extraordinary natural circumstances, the continued biological viability of a stock group is seriously threatened, the harvest rate responses in the relevant fisheries set out above will be applied in the same year if management action is part of further complementary and coordinated management actions being taken in other marine and freshwater chinook fisheries affecting the stock group; and

(g) either Party may recommend, for conservation purposes, that the Commission adopt harvest responses in the relevant fisheries that are greater than those identified in sub-paragraphs (b) and (c) above.

Table 1 Catches specified for AABM fisheries at levels of the chinook abundance index
Values for catch at levels of abundance between those stated may be linearly interpolated between adjacent values.

Abundance Index	SEAK	NBC	WCVI
0.25	52,500	32,500	45,800
0.30	59,000	39,000	55,000
0.35	65,500	45,500	64,200
0.40	72,000	52,000	73,300
0.45	78,500	58,500	82,500
0.495	84,350	64,350	90,760
0.50	85,000	65,000	107,000
0.55	91,500	71,500	117,700
0.60	98,000	78,000	128,300
0.65	104,500	84,500	139,000
0.70	111,000	91,000	149,700
0.75	117,500	97,500	160,400
0.80	124,000	104,000	171,100
0.85	130,500	110,500	181,800
0.90	137,000	117,000	192,500
0.95	143,500	123,500	203,200
1.00	150,000	130,000	213,900
1.005	151,425	130,650	245,694
1.05	164,300	136,500	256,700
1.10	178,500	143,000	268,900
1.15	192,800	149,500	281,100
1.20	207,000	156,000	293,400
1.205	235,100	156,700	294,600
1.25	243,100	163,300	305,600
1.30	252,000	170,700	317,800
1.35	261,000	178,000	330,000
1.40	269,900	185,300	342,300
1.45	278,800	192,700	354,500
1.50	287,700	200,000	366,700
1.505	311,022	219,568	367,929
1.55	319,700	226,100	378,900
1.60	329,400	233,400	391,200
1.65	339,100	240,700	403,400
1.70	348,700	248,000	415,600
1.75	358,400	255,300	427,800
1.80	368,100	262,600	440,000
1.85	377,700	269,900	452,300
1.90	387,400	277,200	464,500
1.95	397,100	284,500	476,700
2.00	406,700	291,800	488,900
2.05	416,400	299,100	501,200
2.10	426,100	306,400	513,400
2.15	435,700	313,700	525,600
2.20	445,400	321,000	537,800
2.25	455,100	328,300	550,100

Attachment I

S.E. Alaska troll, net & sport AABM Fisheries

3)Stock Group[7]	Criteria for Stock Group Concern	Escapement Indicator Stocks	Escapement Objective	Criteria for stock status
Upper Strait of Georgia	Below lower bound of aggregate goal	Klinaklini, Kakwiekan, Wakeman, Kingcome, Nimpkish	Escapement goal range for aggregate	Spawning escapement below lower bound of escapement range for 2 consecutive years.
West Coast Vancouver Island Falls	Below lower bound of aggregate goal	Artlish, Burman, Gold, Kauok, Tahsis, Tashish, Marble Rivers	Escapement goal range for aggregate	Spawning escapement below lower bound of escapement range for 2 consecutive years
North/Central British Columbia	Two or more stocks below lower bound of goals	Yakoun, Skeena, Nass Rivers	Escapement goal range by stock	Spawning escapement below lower bound of escapement range for 2 consecutive years
Far North Migrating Oregon Coastal Falls	Two or more stocks below lower bound of goals	Nehalem, Siuslaw, Siletz Rivers	Escapement goal range by stock	Spawning escapement below lower bound of escapement range for 2 consecutive years
Columbia River Falls	Two or more stocks below lower bound of goals	Up-river Brights, Deschutes, Lewis River	Escapement goal range by stock	Spawning escapement below lower bound of escapement range for 2 consecutive years
Columbia River Summers	Below lower bound of goal	Mid-Columbia Summers	Escapement goal range	Spawning escapement below lower bound of escapement range for 2 consecutive years
Washington Coastal Fall naturals	Three or more stocks below goals	Hoko, Grays Harbor, Queets Hoh, Quillayute rivers	Escapement goal range by stock	Spawning escapement below lower bound of escapement range for 2 consecutive years
Fraser Early (Spring & summers)	Two or more stocks below lower bound of goals	Upper Fraser, Mid Fraser, Thompson	Escapement goal range by stock	Spawning escapement below lower bound of escapement range for 2 consecutive years

---

[7] SEAK fisheries will be managed to achieve escapement objectives for Southeast Alaska and Transboundary River chinook stocks.

Attachment II

Northern BC (Areas 1-5) troll & Queen Charlotte Island sport (Areas 1&2) AABM Fisheries

4)Stock Group	Criteria for Stock Group Concern	Escapement Indicator Stocks	Escapement Objective	Criteria for stock status
North/Central British Columbia	Two or more stocks below lower bound of goals	Yakoun, Skeena, Nass Rivers	Escapement goal range by stock	Spawning escapement below lower bound of escapement range for 2 consecutive years
Upper Strait of Georgia	Below lower bound of aggregate goal	Klinaklini, Kakwiekan, Wakeman, Kingcome, Nimpkish Rivers	Escapement goal range for aggregate	Spawning escapement below lower bound of escapement range for 2 consecutive years
Far North Migrating Oregon Coastal Falls	Two or more stocks below lower bound of goals	Nehalem, Siletz, Siuslaw Rivers	Escapement goal range by stock	Spawning escapement below lower bound of escapement range for 2 consecutive years
Washington Coastal Fall naturals	Three or more stocks below lower bound of goals	Hoko, Grays Harbor, Queets Hoh, Quillayute Rivers	Escapement goal range by stock	Spawning escapement below lower bound of escapement range for 2 consecutive years.
West Coast Vancouver Island Falls	Below lower bound of aggregate goal	Artlish, Burman, Gold, Kauok, Tahsis, Tashish, Marble Rivers	Escapement goal range for aggregate	Spawning escapement below lower bound of escapement range for 2 consecutive years
Columbia River Falls	Two or more stocks below lower bound of range	Up-river Brights, Deschutes, Lewis Rivers	Escapement goal range by stock	Spawning escapement below lower bound of escapement range for 2 consecutive years
Columbia River Summers	Below lower bound of goal	Mid-Columbia Summers	Escapement goal range	Spawning escapement below lower bound of escapement range for 2 consecutive years
Fraser Early (Spring & summers)	Two or more stocks below lower bound of range	Upper Fraser, Mid Fraser, Thompson	Escapement goal range by stock	Spawning escapement below lower bound of escapement range for 2 consecutive years

Attachment III

West Coast Vancouver Island troll & outside sport AABM Fisheries

Stock Group	Criteria for Stock Group Concern	Escapement Indicator Stocks	Escapement Objective	Criteria for [illegible]
Columbia River Falls	Two or more stocks below lower bound of goal	Up-river Brights, Deschutes, Lewis River	Escapement goal ranges	Spawning escapement below lower bound of escapement range for 2 consecutive years
Fraser Late	Below lower bound of goal	Harrison River	Escapement Goal range	Spawning escapement below lower bound of escapement range for 2 consecutive years
Puget Sound Natural Summer/Falls	Three or more stocks below lower bound of goals	Skagit group, Stillaguamish, Snohomish, Lake Washington, Green Rivers	Escapement goal ranges by stock	Spawning escapement below lower bound of escapement range for 2 consecutive years
Columbia River Summers	Below lower bound of goal	Mid-Columbia Summers	Escapement goal range	Spawning escapement below lower bound of escapement range for 2 consecutive years

Attachment IV

All British Columbia ISBM Fisheries

[illegible]	[illegible] Stock Group Concern	[illegible] Indicator Stocks	[illegible] Objective	[illegible]
Lower Strait of Georgia	Below lower bound of aggregate goal for natural spawners	Cowichan, Nanaimo Rivers	Escapement goal range for aggregate	Spawning escapement below lower bound of escapement range for 2 consecutive years
Fraser Late	Below lower bound of goal	Harrison River	Escapement goal range	Spawning escapement below lower bound of escapement range for 2 consecutive years
North Puget Sound Natural Springs	Both stocks below lower bound of goal	Nooksack, Skagit Rivers	Escapement goal range by stock	Spawning escapement below lower bound of escapement range for 2 consecutive years
Upper Strait of Georgia	Below lower bound of aggregate goal	Klinaklini, Kakwiekan, Wakeman, Kingcome Nimpkish Rivers	Escapement goal range for aggregate	Spawning escapement below lower bound of escapement range for 2 consecutive years
Fraser Early (spring & summers)	Two or more stocks below lower bound of goal	Upper Fraser ,Mid Fraser, Thompson	Escapement goal ranges by stock	Spawning escapement below lower bound of escapement range for 2 consecutive years
West Coast Vancouver Island Falls	Below lower bound of aggregate goal	Artlish, Burman, Gold, Kauok, Tahsis, Tashish, Marble Rivers	Escapement goal range for aggregate	Spawning escapement below lower bound of escapement range for 2 consecutive years
Puget Sound Natural Summer/Falls	Three or more stocks below lower bound of goal	Skagit group, Stillaguamish, Snohomish , Lake Washington, Green River	Escapement goal ranges by stock	Spawning escapement below lower bound of escapement range for 2 consecutive years
North/Central British Columbia	Two or more stocks below lower bound of goal	Yakoun, Nass, Skeena, Area 8 (Atnarko, Dean rivers)	Escapement goal range by stock	Spawning escapement below lower bound of escapement range for 2 consecutive years

Attachment V

All Southern U.S. ISBM fisheries

7)Stock Group	Criteria for Stock Group Concern	Escapement Indicator Stocks	Escapement Objective	Criteria for stock status
Washington Coastal Fall Naturals	Three or more stocks below lower bound of goal	Hoko, Grays Harbor Queets, Hoh Quillayute Rivers	Escapement goal range by stock	Spawning escapement below lower bound of escapement range for 2 consecutive years
Columbia River Falls	Two or more stocks below lower bound of goals	Up-river Brights, Deschutes, Lewis River	Escapement goal range by stock	Spawning escapement below lower bound of escapement range for 2 consecutive years
Puget Sound Natural Summer/Falls	Three or more stocks below lower bound of goal	Skagit group, Stillaguamish, Snohomish , Lake Washington, Green Rivers	Escapement goal range by stock	Spawning escapement below lower bound of escapement range for 2 consecutive years
Fraser Late	Below lower bound of goal	Harrison River	Escapement goal range	Spawning escapement below lower bound of escapement range for 2 consecutive years
Columbia River Summers	Below lower bound of goal	Mid-Columbia Summers	Escapement goal range	Spawning escapement below lower bound of escapement range for 2 consecutive years
Far North Migrating Oregon Coastal Falls	Two or more stocks below lower bound of goal	Nehalem, Siletz, Siuslaw Rivers	Escapement goal range by stock	Spawning escapement below lower bound of escapement range for 2 consecutive years
North Puget Sound Natural Springs	Both stocks below lower bound of goal	Nooksack, Skagit Rivers	Escapement goal range by stock	Spawning escapement below lower bound of escapement range for 2 consecutive years

Appendix to Annex IV, Chapter 3

Understanding on the Application of Annex IV, Chapter 3 relating to assignments for the Chinook Technical Committee

(1) Incidental mortality

Improved estimates of incidental fishing mortality are to be developed based upon direct fishery observations. The CTC will collate and document existing information on the coastwide encounter rates for all sources of incidental mortality on chinook coastwide. The CTC will report on the extent of incidental mortality and on deficiencies in the information coverage and will recommend a work plan to address data deficiencies, including observer programs or other direct sampling procedures, that will enable implementation of a total fishing mortality regime for fisheries in 2002. The Parties will implement the work plan in a timely and comprehensive manner to ensure adoption of a total fishing mortality regime in 2002.

The CTC will also evaluate the capacity to predict incidental mortalities, testing assumptions used in determining predictions and identifying options to improve pre-season predictions and estimates of total mortality in AABM and ISBM fisheries.

(2) Overage/Underage provisions

The CTC will adapt the previous overage/underage annex provisions to reflect changes based on:

a) catch established through in-season or pre-season abundance indicators;
b) adjustments for positive deviations from the total mortality index; and
c) deviations from target reductions in ISBM fisheries. The CTC in carrying out this assignment will be guided by paragraph 7 of this Chapter.

The CTC will review a 7.5 percent management range above and below the management objective and consider whether increased flexibility in the management range is desirable or necessary, taking into consideration management precision, increased risk on affected stock groups and consistency with the objectives noted in paragraph 1 of this Chapter.

(3) Total fishing mortality

Consistent with paragraph 3 of this Chapter, the CTC will:

a) specify standardized arrangements for all AABM regimes; and
b) evaluate and identify fisheries where there is a consistent relation between the catch or harvest index and total mortality.

(4) In-season adjustments

Consistent with paragraph 5 of this Chapter, the CTC will evaluate any proposed in-season abundance predictors to determine if these provide reliable and consistent estimates of final abundance over using pre-season predictions.

(5) Model Improvements

The CTC will continue to review and improve the accuracy and precision of the CTC model, including among other things, determining the pre-season forecasts of the aggregate chinook abundance available to the fisheries.

(6) Escapement review

The CTC will evaluate and review existing escapement goals that fishery management agencies have set for chinook stocks subject to this Chapter for consistency with MSY or other agreed biologically-based escapement goals and, where needed, recommend goals for naturally spawning chinook stocks that are consistent with the intent of this Chapter.

(7) Lower escapement bound

For those stocks for which the escapement goals have been recommended by the CTC in accordance with paragraph 6 of this Appendix, the CTC will, prior to end of 2001, review and recommend for adoption to the Commission, criteria defining the lower bound of escapement for the purposes of taking additional management actions pursuant to paragraph 9 of this Chapter.

(8) Description of Technical Components of Chinook Chapter

Members of the CTC involved in the negotiation of this Chapter shall prepare by the autumn 1999 meeting of the Commission a document describing technical components of this Chapter. These components will include, but are not limited to, the following:

i) a description of the abundance index, adult equivalent harvest rate index for catch used in the management of AABM fisheries;
ii) methods for the derivation of the catches (including target harvest rate indices) specified in Table 1;
iii) a description of the procedures associated with adjusting Table 1 in response to revised estimates of abundance and/or harvest rate indices;
iv) a description of the non-ceiling index, anticipated values for each stock group under the general obligation of sub-paragraphs 4 (d) and (e);
v) an example for paragraph 9 (weak stock gate), including an explanation for determination of criteria and stock groupings in Attachments I-V to this Chapter and how lower bounds for escapement goals are determined; and
vi) a retrospective model run for the years 1985 through 1996 incorporating the provisions of this Chapter.

Chapter 4 Fraser River Sockeye and Pink Salmon

1. The provisions of this Chapter shall apply for the period 1999 through 2010.

2. The U.S. share of the annual Fraser River sockeye and pink salmon Total Allowable Catch (the "TAC"), as defined in paragraph 3 to be harvested in the waters of Washington State is as follows:

(a) for sockeye salmon in 1999, the U.S. catch in the Fraser Panel Area shall not exceed 22.4 percent of the TAC;

(b) for sockeye salmon in 2000, the U.S. catch in the Fraser Panel Area shall not exceed 20.4 percent of the TAC;

(c) for sockeye salmon in 2001, the U.S. catch in the Fraser Panel Area shall not exceed 18.4 percent of the TAC;

(d) for sockeye salmon in 2002 through 2010, the U.S. catch in the Fraser Panel Area shall not exceed 16.5 percent of the TAC;

(e) for pink salmon, the U.S. catch in the Fraser Panel Area shall not exceed 25.7 percent of the TAC.

3. For the purpose of this Chapter, the TAC shall be defined as the remaining portion of the annual aggregate Fraser River sockeye and pink runs after the spawning escapements, the agreed Fraser River Aboriginal Exemption, and the catch in Panel authorized test fisheries have been deducted. TAC shall be computed separately for Fraser River sockeye and pink salmon. The following definitions apply to TAC calculations:

(a) The spawning escapement is that escapement which is a direct result of Fraser River Panel management actions, and, therefore, will reflect the results of inadvertent management error by the Fraser River Panel.

(b) For the purposes of in-season management by the Fraser River Panel, the spawning escapement objective is the target set by Canada including any extra requirements that may be determined by Canada and agreed to by the Fraser River Panel, for natural, environmental, or stock assessment factors, to ensure the fish reach the spawning grounds at target levels. Any additional escapement amounts believed necessary by Canada for reasons other than the foregoing will not affect the U.S. catch.

(c) The agreed Fraser River Aboriginal Fishery Exemption is that number of sockeye which is subtracted from the total run size in determining the TAC upon which the U.S. shares specified in paragraph 2 are calculated. Any Canadian harvests in excess of these amounts count against the TAC, and do not affect the U.S. share. The agreed Fraser River Aboriginal Fishery Exemption is 400,000 sockeye annually from 1999 to the expiration of this Chapter.

(d) For computing TAC by stock management groupings, the Fraser River Aboriginal Fishery Exemption shall be allocated to management groups using the average proportional distribution of this harvest for the most recent three cycles unless otherwise agreed.

(e) The Fraser River Panel shall manage the United States fishery to spread the United States harvest proportionately to the TACs across all Fraser River sockeye stock management groupings (Early Stuart, Early Summer, Mid-Summer, and Late Run), except as otherwise may be agreed.

4. Pursuant to Article IV, paragraph 3, Canada shall annually establish the Fraser River sockeye and pink salmon spawning escapement targets for the purpose of calculating the annual TAC. For the purposes of pre-season planning, where possible, Canada shall provide forecasts of run timing and spawning escapement requirements by stock management groupings to the Fraser River Panel no later than the annual meeting of the Commission. Forecasts of migration patterns, gross escapement needs, and any in-season adjustments in escapement requirements shall be provided to the Fraser River Panel by Canada as they become available in order to accommodate the management needs of the Panel in a timely manner. In addition, on a timely basis, the United States shall provide forecasts of sockeye and pink salmon run size returns affected by Panel management.

5. The Fraser River Panel will develop fishing plans and in-season decision rules as may be necessary to implement the intent of this Chapter. The Parties shall establish and maintain data sharing principles and processes which ensure that the Parties, the Commission, and the Fraser River Panel are able to manage their fisheries in a timely manner consistent with this Chapter. With respect to management responsibilities, all activities of the Parties and the Fraser River Panel shall be consistent with the August 13, 1985, Memorandum of Understanding between the Parties.

6. Fraser River Panel pre-season planning meetings that do not occur simultaneously with Commission meetings shall be held alternately in Canada and the United States. Scheduled in-season management meetings shall be held at Richmond, B.C. unless the Panel agrees otherwise. As agreed, Panel meetings may be held by telephone conference call.

7. The Parties may agree to adjust the definition of the Fraser Panel Area as necessary to simplify domestic fishery management and ensure adequate consideration of the effect on other stocks and species harvested in the Area.

8. The shares, as defined in paragraph 2, shall be adjusted each year in the amount of any harvest overage or underage of that annual share of the same species from the previous year or years. In making this adjustment, the share(s) will be reduced by no more than 5 percent because of the adjustment, unless otherwise agreed. The Fraser River Panel shall attempt to balance the shares of the Parties by the expiration of this Chapter. Any remaining balance from the harvest overage or underage shall be incorporated in the subsequent year's allocation. Any residual overage or underage remaining at the last year of this Chapter shall be carried forward into the next Chapter period.

9. The Parties shall establish a Technical Committee for the Fraser River Panel:

(a) the members shall coordinate the technical aspects of Fraser River Panel activities with and between the Commission staff and the national sections of the Fraser River Panel, and shall report, unless otherwise agreed, to their respective National Sections of the Panel. The Committee may receive assignments of a technical nature from the Fraser River Panel and will report results directly to the Panel.

(b) membership of the Technical Committee shall consist of up to five such technical representatives as may be designated by each National Section of the Commission.

(c) members of the Technical Committee shall analyze proposed management regimes, provide technical assistance in the development of proposals for management plans, explain technical reports and provide information and technical advice to their respective National Sections of the Panel.

(d) the Technical Committee shall work with the Commission staff during pre-season development of the fishery regime and management plan and during in-season consideration of regulatory options for the sockeye and pink salmon fisheries of Fraser Panel Area waters and during post-season evaluations of the season to ensure that:

(i) domestic allocation objectives of both Parties are given full consideration;

(ii) conservation requirements and management objectives of the Parties for species and stocks other than Fraser River sockeye and pink salmon in the Fraser Panel Area during periods of Panel regulatory control are given full consideration; and

(iii) the Commission staff is informed in a timely manner of management actions being taken by the Parties in fisheries outside of the Fraser Panel Area that may harvest sockeye and pink salmon of Fraser River origin.

(e) the staff of the Commission shall consult regularly in-season with the Technical Committee to ensure that its members are fully informed in a timely manner on the status of Fraser River sockeye and pink salmon stocks, and the expectations of abundance, migration routes and proposed regulatory options, so the members of the Technical Committee can brief their respective National Sections prior to each in-season Panel meeting.

10. The Parties agree that Panel management actions should meet the following objectives, listed in order of priority:

(a) obtain spawning escapement goals by stock or stock grouping;

(b) meet Treaty defined international allocation; and

(c) achieve domestic objectives.

11. The Fraser River Panel shall manage its fisheries consistent with the provisions of the other chapters of Annex IV to ensure that the conservation needs and management requirements for other salmon species and other sockeye and pink salmon stocks are taken into account.

12. The Parties agree to develop regulations to give effect to the provisions of the preceding paragraphs. Upon approval of the pre-season plan and during the period of Panel regulatory control, all sockeye and pink fisheries under the Panel's jurisdiction are closed unless opened for fishing by in-season order of the Panel.

Chapter 5 Coho Salmon

The provisions of this Chapter shall apply for the period 1999 through 2008.

1. Recognizing that for the past several years some coho stocks have been below levels necessary to sustain maximum harvest and that recent fishing patterns have contributed to a decline in some Canadian and United States coho stocks, the Parties agree to develop management measures and programs to prevent further decline in spawning escapements, adjust fishing patterns, and initiate, develop, or improve management programs for coho stocks.

2. The Parties shall

(a) maintain a joint Coho Technical Committee (the "Committee") reporting, unless otherwise agreed, to the Northern and Southern Panels and the Commission. The Committee shall, *inter alia,* at the direction of the Commission and the Panels:

1) evaluate the effectiveness of management actions;
2) identify and review the status of stocks;
3) present the most current information on harvest rates and patterns on these stocks, and develop a joint database for assessments;
4) collate available information on the productivity of coho stocks in order to identify escapements and associated exploitation rates which produce maximum sustainable harvests (MSH);
5) present historical catch data, associated fishing regimes, and information on stock composition in fisheries harvesting these stocks;
6) devise analytical methods for the development of alternative regulatory and production strategies to meet objectives set forth by the Commission;
7) identify information and research needs, including future monitoring programs for stock assessments; and
8) for each season, make stock and fishery assessments and recommend to the Commission conservation measures consistent with the principles of the Treaty.

(b) establish regimes for troll, sport and net fisheries consistent with management objectives described herein and as may be subsequently recommended and approved by the Commission. For coho stocks shared by fisheries of the United States and Canada, recommendations for fishery regimes shall be made by the Northern Panel for coho salmon originating in rivers with mouths situated between Cape Caution and Cape Suckling and by the Southern Panel for coho salmon originating in rivers with mouths situated south of Cape Caution, as provided in Annex I to the Treaty.

3. In 1999, the Parties agree to implement management measures for depressed coho stocks shared by Washington and southern British Columbia fisheries which are intended to achieve conservation benefits that are consistent with those produced by the management measures implemented in 1998.

4. For coho stocks shared by Washington and southern British Columbia fisheries, the Parties agree to cooperate in the development of coho salmon management programs designed to meet the following objectives:

(a) constrain total fishery exploitation to enable key management units of natural coho stocks to produce maximum sustainable harvests over the long term while maintaining the genetic and ecological diversity of the component populations;

(b) improve long-term prospects for sustaining healthy fisheries in both countries;

(c) establish an approach to fishery resource management which is responsive to resource status, cost-effective, and sufficiently flexible to utilize technical capabilities and information as they are developed and approved;

(d) provide a predictable framework for planning fishery impacts on natural stocks; and

(e) establish an objective basis for monitoring, evaluating and modifying the management regimes as appropriate.

5. Consistent with the objectives set forth in paragraph 4, the Parties agree to develop and implement, beginning in 2000 and extending through 2008, an abundance-based coho management regime for Washington and southern British Columbia fisheries. The components of the regime shall include:

(a) pre-defined rules for determining, in response to the status of affected key management units, maximum allowable annual exploitation rates on key management units for agreed boundary area fisheries (Canadian - WCVI troll/outside sport (that portion of Canadian statistical areas 21, 121, 123, 124, 125, 126 and 127 outside of a line generally one nautical mile seaward from the shoreline or existing Department of Fisheries and Oceans surfline); Nitinat net (Canadian statistical area 21); Strait of Juan de Fuca net (Canadian statistical area 20) and sport fisheries (Canadian statistical areas 20 and 19-1 through 19-4); U.S. ocean troll and sport fisheries North of Cape Falcon (Washington statistical areas 1-4 and 4B; Oregon statistical area 2); Strait of Juan de Fuca troll, net, and sport (Washington statistical areas 5, 6 and 6c); San Juan Islands/Point Roberts net and sport fisheries (Washington statistical areas 6A, 7 and 7A)).

(b) an agreed list of criteria to establish the key management units (i.e., those used to determine annual allowable exploitation rate levels) for naturally spawning coho. Examples of these units are identified in the list below:

Southern B.C. Management Units	U.S. Management Units
Thompson	Skagit
Lower Fraser	Stillaguamish
Strait of Georgia Mainland	Snohomish
Strait of Georgia Vancouver Island	Hood Canal
Johnstone Strait	Eastern Strait of Juan de Fuca
NW Vancouver Island	Western Strait of Juan de Fuca
SW Vancouver Island	Quillayute Summer
Strait of Juan de Fuca	Quillayute Fall
	Hoh
	Queets
	Grays Harbor
	Oregon Coastal Natural

(c) commitments by both Parties to manage all fisheries under their jurisdiction, whether directed at coho or not, to ensure that cumulative exploitation rates by boundary area fisheries on key management units do not exceed the limits established pursuant to the rules developed under paragraph 5(a).

(d) commitments by both Parties to ensure that the level of exploitation is consistent with achieving maximum sustainable harvest for a set of agreed key natural stock management units while maintaining genetic and ecological diversity. If maximum sustainable harvest escapement levels would not be achieved under a fishery regime, the target exploitation rate must not exceed the MSH level and should be below the maximum sustainable harvest exploitation rate to promote rebuilding. The Parties are encouraged to pursue selective fishery practices where critical stock problems are identified within the constraints on allowable impacts on key management units or critical stocks, provided that such selective fisheries do not compromise capabilities to meet conservation objectives for natural stocks, complete stock assessments, or evaluate fishery impacts.

(e) an obligation for each Party to implement such additional management measures for their own fisheries as may be practicable and necessary to address conservation needs for critical stocks within key management units originating within their respective jurisdictions. If additional constraints on fisheries conducted by the other Party are required or desired to meet conservation needs for critical stocks, the proposing Party shall be required to inform the other Party, provide the basis for its determination that additional measures are necessary, and identify the actions taken within its jurisdiction to address conservation needs. This information is to be provided on a schedule sufficient to permit timely consideration by the other Party.

6. To assist the Southern Panel in achieving the objectives set forth in paragraph 4, the Committee shall:

(a) evaluate management actions for the effectiveness of management measures in attaining the objectives established by the Commission;

(b) perform stock and fishery assessments and recommend limits on exploitation rates for key management units of natural coho stocks that are consistent with the objectives set forth in paragraph 4 of this Chapter;

(c) evaluate compliance with the provisions of this Chapter for management of specified fisheries;

(d) apply existing methodologies or develop new methodologies for coho stock and fishery assessment including:

1) estimating exploitation rates relative to total allowable impact levels;
2) evaluating the reliability and accuracy of analytical tools (forecasts, impact models, etc.);
3) estimating by-catch, encounter rates, release mortalities by gear, etc.; and
4) estimating fishing mortality and spawning escapements with desired levels of precision and accuracy;

(e) in February of each year,

1) oversee the exchange of the Parties' determinations of the status of key management units and information on abundance and distributions of coho as available for the upcoming season;

2) review exploitation rates which result from application of pre-defined rules to determine if impacts for agreed boundary area fisheries are excessive given the status of affected management units;
3) review target total exploitation rates provided by the Parties for key management units and stocks of conservation concern which originate within their respective jurisdictions;
4) oversee the timely exchange of the technical basis underlying identification of critical stocks;
5) review any requests for additional constraints on fisheries conducted by another Party in response to conservation needs for those critical stocks pursuant to paragraph 5(e);
6) oversee the exchange of information regarding the conduct of selective fisheries and interceptions of mass marked hatchery fish;

(f) beginning in the year 2001, complete an annual post-season assessment by February 1 for the most recent year for which necessary data are available to:

(1) estimate exploitation rates on key management units for the agreed boundary area fisheries;
(2) determine the accuracy of pre-season expectations of status for key management units; and
(3) estimate total exploitation rates (by all fisheries combined) experienced by natural stocks; and

(g) undertake specific assignments as described in the Appendix to this Chapter.

7. The Parties shall appoint a Working Group to facilitate collaborative development of the coho management regime and assessment tools associated with the development and initial implementation of the fishery regime established by paragraphs 4 and 5. The Working Group shall develop mechanisms to address circumstances where annual limits on exploitation rates for boundary area fisheries are exceeded. Such mechanisms may include provisions for management error and penalties for overages, but shall not create catch entitlements for any fishery or Party.

8. Technical disputes which may arise relating to paragraphs 3 through 7 above shall be resolved in accordance with Article XII of the Treaty. Policy disputes regarding implementation of this regime will be referred to the full Southern Panel for resolution. Such issues, if unresolved by the Southern Panel or the technical dispute resolution mechanism, will be referred to the Commission, which may elect to resolve the matter itself, or refer the issue to appropriate processes to ensure timely and expeditious resolution.

9. During initial development of the coho regime established by paragraphs 4 through 6, the Southern Panel will annually review performance and recommend modifications as necessary to accomplish the management objectives set forth in paragraph 4. In response to recommendations resulting from the annual reviews, the Parties agree to develop modifications for implementation as soon as practicable thereafter.

10. Beginning in 2003 and every 3 years thereafter, the Southern Panel will review the performance of the coho regime established by this Chapter and may recommend modifications as necessary to accomplish the management objectives set forth in paragraph 4. The reviews shall include recommendations as to whether or not limitations on fisheries in the Strait of Georgia or the interception of hatchery fish should be incorporated into bilateral fishing arrangements. In response to recommendations resulting from the periodic reviews, the Parties agree to develop modifications for implementation as soon as practicable thereafter.

11. Between April and June of each year, Canadian and U.S. domestic management authorities will exchange information on the management measures under paragraphs 4 to 6 that are to be implemented to ensure that the cumulative exploitation rates by agreed boundary area fisheries do not exceed allowable levels for key management units and that total exploitation by all fisheries is consistent with target levels established by the Parties for resource conservation.

12. Unless otherwise agreed by the Parties for the duration of this Chapter, the Northern Boundary Technical Committee shall undertake the technical assignments described in paragraph 2 for coho salmon originating in rivers and mouths situated between Cape Caution and Cape Suckling.

Appendix to Annex IV, Chapter 5
Understanding on the Application of Annex IV, Chapter 5 (Coho Salmon)

The joint Coho Technical Committee shall;

1. complete, no later than December of 1999, the following specific assignments with respect to stocks in the Southern Panel Area:

   (a) develop pre-defined rules for agreed boundary area fisheries that establish maximum limits on exploitation rates on key management units in response to the status of those units;

   (b) review the methods that each Party uses to determine the status of key management units, MSH escapement targets and sustainable exploitation rates;

   (c) conduct workshops or working sessions on topics that are central to the task of developing the management framework:

   1) criteria and standards for identifying management units;
   2) review methods for stock assessment (including estimation of escapements and exploitation rates);
   3) identification of MSH escapement levels and sustainable exploitation rates under varying survivals;
   4) methods of incorporating risk in protection of genetic and ecological diversity; and
   5) standards for emerging methods for estimating stock composition (DNA); and

   (d) develop a regional coho model to provide a consistent means of evaluating the cumulative impact of U.S. and Canadian fisheries on key management units and stocks of conservation concern;

2. complete, no later than January of 2001, the following specific assignments:

   (a) make recommendations for monitoring and evaluation systems relating to fishery performance and stock exploitation rates and productivities; and

   (b) make recommendations to improve the efficiency and cost effectiveness of bilateral coho management systems.

Chapter 6 Southern British Columbia and Washington State Chum Salmon

The provisions of this Chapter shall apply for the period 1999 through 2008.

1. The Parties shall maintain a joint Chum Technical Committee ("the Committee") reporting, unless otherwise agreed, to the Southern Panel and the Commission. The Committee will undertake to, *inter alia*,:

(a) identify and review the status of stocks of primary concern;

(b) present the most current information on harvest rates and patterns on these stocks, and develop a joint database for assessments;

(c) collate available information on the productivity of chum stocks to identify escapements which produce maximum sustainable harvests and allowable harvest rates;

(d) present historical catch data, associated fishing regimes, and information on stock composition in fisheries harvesting those stocks;

(e) devise analytical methods for the development of alternative regulatory and production strategies;

(f) identify information and research needs, to include future monitoring programs for stock assessment; and

(g) for each season, make stock and fishery assessments and evaluate the effectiveness of management.

2. In the years 1999 through 2008, Canada will manage its Johnstone Strait, Strait of Georgia, and Fraser River chum fisheries to provide continued rebuilding of depressed naturally spawning chum stocks, and, to the extent practicable, minimize increased interceptions of United States origin chum. Terminal fisheries conducted on specific stocks with identified surpluses will be managed to minimize interception of non-targeted stocks.

3. In the years 1999 through 2008,

a) for Johnstone Strait run sizes less than 3.0 million

(i) Canada, taking into account the catch of Canadian chum in United States Areas 7 and 7A, will limit its harvest rate in Johnstone Strait to less than 10 percent, resulting in a Johnstone Strait catch level of up to 280,000 chum; and

(ii) when the catch in Johnstone Strait is 280,000 chum or less, the United States catch of chum in Areas 7 and 7A shall be limited to chum taken incidentally to other species and in other minor fisheries, but shall not exceed 20,000, provided, however, that catches for the purposes of electrophoretic sampling shall not be included in the aforementioned limit;

(b) for Johnstone Strait run sizes from 3.0 million to 3.9 million

(i) Canada, taking into account the catch of Canadian chum in United States Areas 7 and 7A, will limit its harvest rate in Johnstone Strait to 20 percent, resulting in a Johnstone Strait catch level of 280,000 to 745,000 chum; and

(ii) when the catch in Johnstone Strait is from 280,000 to 745,000 chum, the United States catch of chum in Areas 7 and 7A shall not exceed 120,000;

(c) for Johnstone Strait run sizes of 3.9 million and greater

(i) Canada, taking into account the catch of Canadian chum in United States Areas 7 and 7A, will harvest at a rate in Johnstone Strait of 30 percent or greater, resulting in a Johnstone Strait catch level of 745,000 chum or greater; and

(ii) when the catch in Johnstone Strait is 745,000 chum or greater, the United States catch of chum in Areas 7 and 7A shall not exceed 140,000;

(d) it is understood that the Johnstone Strait run sizes, harvest rates, and catch levels referred to in 3(a), 3(b), and 3(c) are those determined in season, in Johnstone Strait, by Canada; and

(e) the United States shall manage in a manner that, as far as practicable, maintains a traditional proportion of effort and catch between United States Areas 7 and 7A, and avoids concentrations of effort along the boundary in Area 7A.

4. In the years 1999 through 2008, the United States shall conduct its chum fishery in the Strait of Juan de Fuca (United States Areas 4B, 5 and 6C) so as to maintain the limited effort nature of this fishery, and, to the extent practicable, minimize increased interceptions of Canadian origin chum. The United States shall continue to monitor this fishery to determine if recent catch levels indicate an increasing level of interception.

5. If, in any year, the United States chum fishery in Areas 7 and 7A fails to achieve the catch levels specified in paragraphs 3(a)(ii), 3(b)(ii) and 3(c)(ii), any differences shall be compensated by adjustments to the Areas 7 and 7A fishery in subsequent years, except that chum catches below the level specified in paragraph 3(a)(ii) shall not be compensated.

6. Catch compositions in fisheries covered by this Chapter will be estimated by post-season analysis using methods agreed upon by the Committee.

7. Canada will manage the Nitinat net chum fishery to minimize the harvest of non-targeted stocks.

8. In the years 1999 through 2008, Canada shall conduct electrophoretic sampling of chum taken in the West Coast Vancouver Island troll fishery if early-season catch information indicates that catch totals for the season may reach levels similar to 1985 and 1986. Sampling, should it occur, will include catches taken from the southern areas (Canadian Areas 121-124).

9. During the period of August 1 though September 15 of each year, Canada will require the live release of chum salmon from all purse seine gear fishing in the Strait of Juan de Fuca (Canadian Area 20) and the United States will require the same for non-Indian seine fisheries in Areas 7 and 7A. Note: purse seine fisheries are not permitted in U.S. Areas 4B, 5 and 6C.

10. Canada and the United States shall assess catch levels and make attempts to collect additional genetic samples from any chum salmon caught during the August 1 through September 15 time period in the boundary area fisheries (U.S. Areas 4B, 5, 6C, 7 and 7A; Canadian Areas 18, 19, 20, 21 and 29).

Chapter 7 General Obligations

With respect to intercepting fisheries not dealt with elsewhere in this Annex, unless otherwise agreed, neither Party shall initiate new intercepting fisheries, nor conduct or redirect fisheries in a manner that intentionally increases interceptions.

Attachment A

Amendment to Annex I of the Pacific Salmon Treaty

The Parties agree to add paragraph (d) as follows :

d) a Transboundary Panel for salmon originating in the Alsek, Stikine and Taku River systems.

Attachment B

Management of Northern Boundary Coho

1. The Government of Canada and the Government of the United States (the “Parties”) agree on the following actions to be taken by their respective management authorities in implementation of the conservation provisions of the Pacific Salmon Treaty.

2. If projected all-gear commercial catch of coho salmon in Southeast Alaska is less than 1.1 million wild fish (as determined from the historical relationship between average catch per boat day in the Alaska troll fishery during statistical weeks 28 and 29 and the total all-gear coho catch in Southeast Alaska), then Alaska will close its troll fishery for up to seven days beginning on or about July 25. If Alaska closes its troll fishery based on this assessment, Canada will close its troll fishery in Areas 1, 3, 4, 5 and adjacent off-shore areas for the same time period.

3. If the Alaska Fisheries Performance District (“FPD”) Area 6 troll fishery statistical week 27, 28 and 29 average catch per boat day is:

(a) less than 10, Alaska will close its troll during statistical weeks 31, 32 and 33 in waters south of a line from:

1) Male Point at 54°47’46”N - 130°36’57”W to
2) Foggy Point at 54°55’20”N - 130° 58’43”W to
3) Duke Point at 54°55’20”N - 131°11’52”W to
4) Percy Point at 54°56’49”N - 131°36’58”W to
5) Rip Point at 55°02’15”N - 131°58’51”W to
6) Leading Point at 54°48’43”N - 132°22’25”W to
7) Dall Island at 54°48’43”N - 132°49’06”W to
8) Sakie Point at 55°03’25”N - 133°13’30”W to
9) Eagle Point on Dall Island at 55°14’32”N - 133°13’06”W to
10) Point Arboleda at 55°19’08”N - 133°27’35”W to
11) Point San Roque at 54°20’12”N - 133° 32’36”W to
12) Cape Ulitka at 55°33’47”N - 133°43’39”W to
13) Cape Lynch at 55°46’59”N - 133°41’47”W to
14) Helm Point at 55°49’34”N - 134°16’41”W and then
15) westward along the parallel of latitude of 55°49’34”N to the limit of the U.S. Exclusive Economic Zone.

Canada agrees to close its troll fishery in Areas 1, 3, 4, 5 and adjacent offshore areas for the same time period.[8]

(b) between 10 and 14, Alaska will close its troll fishery during statistical weeks 31 and 32 in waters south of a line from:

1) Male Point at 54° 47’46”N - 130°36’57”W to
2) Foggy Point at 54°55’20”N - 130°58’43”W to
3) Duke Point at 54°55’20”N - 131°11’52”W to
4) Percy Point at 54° 56’49”N - 131° 36’58”W to

---

[8] The Parties agree to review the decision to close the fishery after fourteen days and consider any new information regarding the need for continuation of the fishery closure.

5) Rip Point at 55°02'15"N - 131°58'51"W to
6) Leading Point at 54°48'43"N - 132°22'25"W to
7) Dall Island at 54°48'43"N - 132° 49'06"W to
8) Sakie Point at 55°03'25" - 133°13'30"W and then
9) westward along the parallel of latitude of 55°03'25"N to the limit of the U.S. Exclusive Economic Zone.

Canada agrees to close its troll fishery in Areas 1, 3, 4 and 5 and adjacent offshore areas for the same time period.

(c) between 15 and 22, Alaska will close its troll fishery beginning in statistical week 31 and continuing for 10 days in the same waters referred to in subparagraph (b) above. Canada agrees to close its troll fishery in Areas 1, 3, 4 and 5 and adjacent offshore areas for the same time period.

4. In addition, the Parties agree:

(a) Canadian managers from the North Coast Division and U.S. managers from Southeast Alaska will exchange on a weekly basis information on coho regarding stock status, catches and fishery management information including open areas and times for each fishery;

(b) the Northern Boundary Technical Committee shall develop a work plan to develop MSY escapement goals for Skeena and Nass River coho, to improve stock assessment programs, to develop in-season and post-season abundance determinations and to improve fishery performance data;

(c) to complete by June 30, 1999, a bilateral report by the Northern Boundary Technical Committee on the status of coho salmon stocks in the Northern Boundary Area;

(d) that the calculation of the catch per unit effort (the "CPUE") associated with the closure of the Southeast Alaska troll fishery when the all-gear harvest is projected to be less than 1.1 million wild fish may change over time as methods and assessments improve. Any new method will be bilaterally reviewed prior to its implementation;

(e) that, in the event that Alaskan troll fishery effort in FPD Area 6 is insufficient to provide necessary CPUE data for the determination under paragraph 2 above, the Parties agree to consult prior to statistical week 29 and consider other in-season abundance data to make such determinations; and

(f) that, during the period of closure referred to above, the Parties may agree on the employment of selective fishing techniques in their troll fisheries to access other species or stocks pursuant to relevant Annex IV provisions.

5. Alaska will maintain its troll management plan with regard to closure of up to 10 days in early to mid August. Alaska may modify its troll management plan in future years to address or reduce incidental mortality of chinook in the coho fishery. Alaska will consult with Canada regarding any such changes prior to implementation.

6. The provisions of this agreement are without prejudice to the position of either Party with respect to the location of the maritime boundary in the Dixon Entrance area.

Attachment C
Northern Boundary and Transboundary Rivers Restoration and Enhancement Fund

The Government of Canada and the Government of the United States agree that:

1. There shall be established a Northern Boundary and Transboundary Rivers Restoration and Enhancement Fund, hereinafter referred to as "the Northern Fund".

2. The geographic area for the Northern Fund shall be Northern and Central British Columbia, Southeast Alaska, and the drainage of the Alsek, Taku and Stikine Rivers.

3. The Northern Fund shall be used to support the following activities:

    a) development of improved information for resource management, including better stock assessment, data acquisition, and improved scientific understanding of factors affecting salmon production in the freshwater and marine environments;

    b) rehabilitation and restoration of habitat, and improvement of natural habitat to enhance productivity and protection of Pacific salmon; and

    c) enhancement of wild stock production through low technology techniques rather than through large facilities with high operating costs.

4. The Northern Fund shall be constituted by a grant of $75 million USD to be provided by the United States subject to the obtaining of specific legislative authority and the availability of funds. Either Party may make additional contributions to the Northern Fund. Contributions to the Northern Fund by a third party may be made with the agreement of the Parties.

5. The Northern Fund shall be held by the Pacific Salmon Commission pursuant to the Pacific Salmon Commission bylaws and invested in accordance with the terms of a "Trust Agreement" to be drawn up by the Parties.

6. The Northern Fund shall be administered by a Northern Fund Committee, composed of 3 representatives appointed by the Government of Canada and 3 representatives appointed by the Government of the United States, which will be responsible for the approval of expenditure of monies from the Northern Fund. Annual expenditures shall not exceed the annual earnings from the invested principal of the Northern Fund. The cost of administering the Northern Fund shall be drawn from the income of the Northern Fund.

7. The Northern Fund Committee shall develop procedures for the acceptance, review, evaluation and approval of proposals for the use of the income of the Northern Fund.

8. Monies from the Northern Fund shall be disbursed by the Pacific Salmon Commission at the direction of the Northern Fund Committee. No funds may be disbursed from the Northern Fund after the expiration of the fishery arrangements in Chapters 1 and 2 of Annex IV of the Pacific Salmon Treaty until new fishing arrangements are agreed by the Parties.

9. In the event that the above provisions relating to the Northern Fund, or the Pacific Salmon Treaty, are terminated, all monies in the Northern Fund shall, subject to the provisions of the Trust Agreement, revert back to the Party that contributed those monies. Any investment income earned up to the date of reversion shall be distributed to the Parties in proportion to their contribution.

Southern Boundary Restoration and Enhancement Fund

The Government of Canada and the Government of the United States agree that:

1. There shall be established a Southern Boundary Restoration and Enhancement Fund, hereinafter referred to as "the Southern Fund."

2. The geographic area for the Southern Fund shall be southern British Columbia, the States of Washington and Oregon, and the Snake River basin in Idaho.

3. The Southern Fund shall be used to support the following activities:

   a) development of improved information for resource management, including better stock assessment, data acquisition, and improved scientific understanding of limiting factors affecting salmon production in the freshwater and marine environments;

   b) rehabilitation and restoration of marine and freshwater habitat, and improvement of habitat to enhance productivity and protection of Pacific Salmon; and

   c) enhancement of wild stock production through low technology techniques rather than through large facilities with high operating costs.

4. The Southern Fund shall be constituted by a grant of $65 million USD to be provided by the United States, subject to the obtaining of specific legislative authority and the availability of funds. Either Party may make additional contributions to the Fund. Contributions to the Southern Fund by a third party may be made with the agreement of the Parties.

5. The Southern Fund shall be held by the Pacific Salmon Commission pursuant to the Pacific Salmon Commission bylaws and invested in accordance with the terms of a "Trust Agreement" to be drawn up by the Parties.

6. The Southern Fund shall be administered by a Southern Fund Committee, composed of 3 representatives appointed by the Government of Canada and 3 representatives appointed by the Government of the United States, which will be responsible for the approval of expenditure of moneys from the Southern Fund. Annual expenditures shall not exceed the annual earnings from the invested principal of the Southern Fund. The cost of administering the Southern Fund shall be drawn from the income of the Southern Fund.

7. The Southern Fund Committee shall develop procedures for the acceptance, review, evaluation and approval of proposals for the use of the income of the Southern Fund.

8. Monies from the Southern Fund shall be disbursed by the Pacific Salmon Commission at the direction of the Southern Fund Committee. No funds may be disbursed from the Southern Fund after the expiration of the fishery arrangements in Chapters 4 and 5 of Annex IV of the Pacific Salmon Treaty until new fishing arrangements are agreed by the Parties.

9. In the event that the above provisions relating to the Southern Fund, or the Pacific Salmon Treaty, are terminated, all monies in the Southern Fund shall, subject to the provisions of the Trust Agreement, revert back to the Party that contributed those monies. Any investment income earned up to the date of reversion shall be distributed to the Parties in proportion to their contribution.

Attachment D

Renewed Cooperation on Scientific and Institutional Matters

Recognizing the advantages of enhanced cooperation in the management and stewardship of Pacific salmon,

Recognizing the benefits of increased stability in the management and stewardship of Pacific salmon under the Pacific Salmon Treaty,

Recognizing the benefits of continued bilateral agreement,

Recognizing the advantages of consultation and cooperation on science and information exchange,

Recognizing the benefits of processes for getting information for management, including the development of common assessment models,

Recognizing the need to develop clearer distinctions between technical and policy issues,

Recognizing that improved institutional arrangements and greater cooperation on science will facilitate improved resource management,

The Government of Canada and the Government of the United States (the "Parties") agree to:

> (a) participate, to the extent practicable, in each other's public consultation processes leading to the establishment of annual management regimes;
>
> (b) encourage greater cooperation between fisheries managers through, *inter alia,* staff exchange arrangements, workshops and timely exchange of data;
>
> (c) review the committee structure of the Pacific Salmon Commission (the "Commission") to ensure that current committees are functioning effectively;
>
> (d) request the Commission to eliminate the Committee on Research and Statistics and to reconstitute it as the Committee on Scientific Cooperation which shall be comprised of no more than eight members, drawn from both governmental and non-governmental scientific communities, to be nominated four each by the respective National Sections of the Commission with the mandate to:
>
> > (i) assist in consultation with the scientific and technical committees of the Commission in setting the scientific agenda for the Commission, including identifying emerging issues and subjects for research and monitoring progress;
> >
> > (ii) monitor the progress of the Parties in enhancing cooperation and consultation on science including such matters as timely data exchange, the development of common assessment models, and scientific and technical exchanges;

(iii) provide support to the scientific and technical committees of the Commission including advising the Commission at its request on the distinction between technical and policy issues, and assisting in arranging peer review evaluation of scientific reports;

(iv) undertake the tasks assigned to it in the agreement on Habitat and Restoration; and

(v) make recommendations to the Parties on enhancing scientific consultation and cooperation ;

(e) encourage the resolution of scientific issues at the technical level through the Commission's committees; and,

(f) request the Commission to elaborate rules and procedures, as necessary, for the implementation of the process set out in Article XII of the Pacific Salmon Treaty.

Attachment E

Habitat and Restoration

Considering agreements reached between the Government of the United States and the Government of Canada (the "Parties") to implement abundance-based management regimes designed to prevent overfishing;

Taking into account the decline in abundance and productivity of important naturally spawning stocks of Pacific salmon subject to the Pacific Salmon Treaty (the "Treaty");

Recognizing that protection and restoration of salmon habitat and maintenance of adequate water quality and quantity are vital to achieving improved spawning success, safe passage of adult and juvenile salmon and, therefore, optimum production of important naturally spawning stocks;

Recognizing that the principles and objectives of the Treaty can only be achieved if the Parties maintain and increase the production of natural stocks;

Recognizing that a carefully designed enhancement program would contribute significantly to the restoration of depressed natural stocks and assist the Parties in achieving optimum production;

Desiring to cooperate so as to achieve optimum production, the Parties agree:

1) To use their best efforts, consistent with applicable law, to:

    a) protect and restore habitat so as to promote safe passage of adult and juvenile salmon and achieve high levels of natural production,
    b) maintain and, as needed, improve safe passage of salmon to and from their natal streams, and
    c) maintain adequate water quality and quantity.

2) To promote these objectives by requesting the Commission to report annually to the Parties on:

    a) naturally spawning stocks subject to the Treaty for which agreed harvest controls alone cannot restore optimum production,
    b) non-fishing factors affecting the safe passage of salmon as well as the survival of juvenile salmon which limit production of salmon identified in sub-paragraph 2(a) above,
    c) options for addressing non-fishing constraints and restoring optimum production, and
    d) progress of the Parties' efforts to achieve the objectives of this agreement for the stocks identified in sub-paragraph 2(a) above.

3) The Committee on Scientific Cooperation, when constituted, shall, in consultation with the scientific and technical committees of the Pacific Salmon Commission (the "Commission"), provide advice to the Commission for referral to the Parties regarding non-fishing factors affecting the safe passage and optimum production of salmon.

Appendix E

Appointment of Officers for 1999/2000

Effective December 1, 1999, a new slate of officers for the Pacific Salmon Commission was identified as follows:

a)	Commission Chair	U.S.	Curt Smitch
b)	Commission Vice-Chair	Can	Pat Chamut
c)	Fraser River Panel Chair	U.S.	Lorraine Loomis
d)	Fraser River Panel Vice-Chair	Can.	Wayne Saito
e)	Northern Panel Chair	U.S.	
f)	Northern Panel Vice-Chair	Can.	David Einarson
g)	Southern Panel Chair	Can.	Greg Savard
h)	Southern Panel Vice-Chair	U.S.	Terry Williams
i)	Transboundary Panel Chair	Can.	Gord Zealand
j)	Transboundary Panel Vice-Chair	U.S.	
k)	Standing Committee on F&A - Chair	U.S.	Rollie Rousseau
l)	Standing Committee on F&A - Vice-Chair	Can.	Pat Chamut
m)	Standing Committee on Scientific Cooperation - Chair	Can.	
n)	Standing Committee on Scientific Cooperation - Vice-Chair	U.S.	

Appendix F

Approved Budget FY 2000/2001

1.	INCOME	
A.	Contribution from Canada	$800,000
B.	Contribution from U.S.	$800,000
	Sub total	$1,600,000
C.	Carry-over from 1998/99	$769,911
D.	Interest	$23,820
E.	Other income	$0
F.	Total Income	$2,393,731
2.	EXPENDITURES	
A.	1. Permanent Salaries and Benefits	$1,367,143
	2. Temporary Salaries and Benefits	$220,347
	3. Total Salaries and Benefits	$1,587,490
B.	Travel	$92,560
C.	Rents, Communications, Utilities	$118,808
D.	Printing and Publications	$23,700
E.	Contractual Services	$329,144
F.	Supplies and Materials	$42,358
G.	Equipment	$166,873
H.	Total Expenditures	$2,360,933
3.	BALANCE (DEFICIT)	$32,798
4.	TEST FISHING PROGRAM	
A.	Forecast Revenues	$832,308
B.	Forecast Expenditures	$740,244
C.	Forecast Balance	$92,064
5.	TOTAL BALANCE (DEFICIT)	$124,862

Appendix G

Pacific Salmon Commission
Secretariat Staff as of March 31, 2000

EXECUTIVE OFFICE

Don Kowal
Executive Secretary

Teri Tarita
Records Administrator/Librarian

Janice Bakas
Secretary

Vicki Ryall
Meeting Planner

FINANCE & ADMINISTRATION

Kenneth N. Medlock
Finance and Administration

Bonnie Dalziel
Accountant

FISHERY MANAGEMENT

James C. Woodey
Chief Biologist

Jim Gable
Head, Racial Identification Group

Mike Lapointe
Project Biologist, Sockeye

Bruce White
Project Biologist, Pinks

Keith Forrest
Racial Data Biologist

Jullie Andersen
Senior Scale Analyst

Maxine Reichardt
Scale Analyst

Holly Derham
Assistant Scale Analyst

Jim Cave
Head, Stock Monitoring Group

Peter Cheng
Project Biologist, Acoustics

Yunbo Xie
Hydroacoustics Scientist

Ian Guthrie
Head, Biometrics

Doug Stelter
Statistician

Kathy Mulholland
Computer Systems Manager

Andrew Gray
Hydroacoustics Biologist (Term)

Pieter Van Will
Test Fishing Biologist (Term)

Appendix H

Membership Lists for Standing Committees, Panels, Joint Technical Committees and other Appointments as of March 31, 2000

UNITED STATES	CANADA

1. STANDING COMMITTEE ON FINANCE AND ADMINISTRATION

UNITED STATES	CANADA
Mr. Rollie Rousseau (Chair)	Mr. Patrick S. Chamut (Vice-Chair)
Mr. David Benton	
Mr. Charles K. Walters	
Mr. James Heffernan	
Mr. W. Ron Allen	
Ms. Carol Fuller	

Staff: D. Kowal (ex. officio)

Editorial Board

UNITED STATES	CANADA
Dr. Norma Jean Sands	Mr. Tim Young

Staff: D. Kowal (ex. officio)

2. STANDING COMMITTEE ON RESEARCH & STATISTICS

Dissolved in 1999

Ad Hoc Joint Interceptions Committee

Dissolved in 1999

Ad Hoc Joint Objectives and Goals Committee

Dissolved in 1999

3. FRASER RIVER PANEL

UNITED STATES	CANADA
Ms. Lorraine Loomis (Chair)	Mr. Wayne Saito (Vice-Chair)
Mr. A. Dennis Austin	Mr. Murray Chatwin
Mr. William L. Robinson	Mr. Mike Griswold
Mr. Robert Suggs	Mr. Terry Lubzinski
	Chief Susan McKamey
	Mr. Larry Wick

Fraser River Panel Alternates

Mr. Ronald G. Charles
Mr. Rob Zuanich
Mr. Dave Cantillon
Mr. Richard Lincoln

Mr. Brian Assu
Mr. Brent Hargreaves
Ms. Lilly Johnson
Mr. William Otway
Mr. Les Rombough
Mr. Stan Watterson

4. SOUTHERN PANEL

Mr. Terry R. Williams (Vice-Chair)
Mr. Patrick Pattillo
Mr. Burnell Bohn
Mr. Peter Dygert
Mr. James E. Harp
Mr. Keith E. Wilkinson

Mr. Greg Savard (Chair)
Mr. John Legate
Mr. Wayne Harling
Mr. Basil Ambers
Mr. John Sutcliffe
Mr. Jeremey Maynard

Southern Panel Alternates

Mr. Guy Norman
Mr. Michael A. Peters
Mr. Richard Lincoln
Mr. Larry Carpenter
Mr. Robert Wunderlich

Chief Larry Baird Sr.
Mr. Terry Kueber
Mr. Don Hall
Mr. Ed Lockbaum
Mr. Geoff Chislett
Mr. Peter Sakic

5. NORTHERN PANEL

Mr. Arnold Enge
Mr. William Foster
Mr. James E. Bacon
Mr. William Hines
Mr. Howard Pendell

Mr. Dave Einarson (Vice-Chair)
Mr. Ron Fowler
Mr. G.E. Shepard
Mr. John Murray
Mr. John McCulloch
Mr. Russ Jones

Northern Panel Alternates

Mr. Scott Marshall
Mr. Thomas Jacobson
Mr. Robert M. Thorstenson
Mr. James D. Becker
Mr. Andrew W. Ebona
Mr. Ronald J. Berg

Mr. John Brockley
Mr. Chris Barnes
Mr. Robert H. Hill
Mr. Rick Haugan

6. TRANSBOUNDARY PANEL

To be appointed in April 2000

Mr. Gordon Zealand (Chair)
Mr. John Ward
Mr. Stephen Jacobs
Ms. Yvonne Tashoots
Mr. Ronald Chambers
Mr. Ray Kendel

7. STANDING COMMITTEE ON SCIENTIFIC COOPERATION

To be appointed

8. SELECTIVE FISHERY EVALUATION COMMITTEE

Dr. Gary S. Morishima (Co-Chair)
Ms. Marianna Alexandersdottir
Mr. Lee H. Blankenship
Mr. Mike Burner
Mr. Rich Comstock
Mr. Glen T. Oliver
Mr. Ron Olson
Mr. Patrick Pattillo
Dr. Norma Jean Sands
Ms. Annette Hoffmann
Ms. Carrie Cook-Tabor
Mr. Ken Johnson
Mr. Mike Matylewich
Mr. Ron Josephson

Mr. Blair Holtby (Co-Chair)
Ms. Susan Bates
Ms. Sue Lehmann
Dr. Brian Riddell

9. HABITAT COMMITTEE

To be appointed

10. NORTHERN FUND COMMITTEE

To be appointed

Mr. John Lubar
Mr. Ron Fowler
Mr. Gordon Zealand

11. SOUTHERN FUND COMMITTEE

To be appointed

Mr. Ron Kadowaki
Mr. Don Hall
Mr. Bill Otway

12. JOINT CHINOOK TECHNICAL COMMITTEE

Mr. James B. Scott (Co-Chair)
Mr. Gary R. Freitag
Mr. Edward Bowles
Mr. Alex C. Wertheimer
Dr. Robert Kope
Dr. Douglas M. Eggers
Mr. Ronald H. Williams
Dr. Gary S. Morishima
Dr. Phaedra Budy
Ms. Lisa A. Wood
Mr. Gregg Mauser
Mr. Dave Gaudet
Mr. John Carlile
Ms. Marianne McClure
Dr. John H. Clark
Mr. Scott McPherson
Mr. C. Dell Simmons
Ms. Marianna Alexandersdottir
Mr. Shijie Zhou
Mr. David Bernard
Mr. Mark Stopha

Dr. Brian Riddell (Co-Chair)
Ms. Barb Snyder
Mr. Wilf Luedke
Dr. Jim Irvine
Mr. Bill Shaw
Dr. Brent Hargreaves
Mr. Din Chen

Joint Chinook Working Group

t.b.a. (Co-Chair)
Ms. Teresa Scott
Mr. Dave Gaudet
Mr. Thomas Jacobson
Mr. Burnell Bohn
Mr. Terry R. Williams
Mr. Keith E. Wilkinson
Mr. William L. Robinson
Mr. James E. Harp

Mr. Ed Lochbaum (Co-Chair)
Dr. Brian Riddell
Mr. Wilf Luedke
Mr. Russ Jones
Mr. William Otway
Mr. Dave Einarson
Mr. Ron Fowler
Mr. Bill Shaw

Joint Chinook Working Group – Alternates

Mr. James B. Scott
Mr. James E. Bacon
Mr. William Foster

Dr. Brent Hargreaves

13. JOINT COHO TECHNICAL COMMITTEE

Dr. Gary S. Morishima (Co-Chair)
Mr. James B. Scott
Mr. Robert A. Hayman
Dr. Peter W. Lawson
Ms. Carrie Cook-Tabor
Mr. Bill Tweit
Ms. Marianna Alexandersdottir
Ms. Kristin Nason
Mr. James F. Packer

Mr. Sam Sharr
Mr. Ron Kadowaki (Co-Chair)
Dr. Blair Holtby
Mr. Richard Bailey
Mr. Bill Shaw

Northern Coho

Dr. John H. Clark
Ms. Michele Masuda
Mr. Leon D. Shaul
Mr. Dave Gaudet

14. JOINT CHUM TECHNICAL COMMITTEE

Mr. Gary R. Graves (Co-Chair)
Mr. Nick Lampsakis
Mr. Jon Anderson
Mr. Randy Hatch
Dr. Gary Winans
Mr. Roger Peters

Mr. Paul Ryall (Co-Chair)
Mr. Wilf Luedke
Mr. Leroy Hop Wo
Mr. Clyde Murray

15. JOINT NORTHERN BOUNDARY TECHNICAL COMMITTEE

Mr. Ben Van Alen (Co-Chair)
Dr. Jack H. Helle
Mr. Phillip S. Doherty
Mr. Glen T. Oliver
Mr. Gary R. Freitag
Dr. Jim Blick
Dr. Jerome J. Pella
Mr. Paul Suchanek
Mr. Tim Zadina

Mr. David Peacock (Co-Chair)
Mr. Les Jantz
Ms. Barb Snyder
Mr. R.S. Hooton
Dr. Chris Wood
Dr. Skip McKinnell
Dr. Blair Holtby

16. JOINT TRANSBOUNDARY TECHNICAL COMMITTEE

Mr. Scott Kelley (Co-Chair)
Mr. Andrew J. McGregor
Mr. John H. Eiler
Mr. William R. Bergmann
Ms. Kathleen A. Jensen
Mr. Keith Pahlke
Mr. Brian Lynch
Mr. Alan Burkholder

Mr. Sandy Johnston (Co-Chair)
Mr. Pat Milligan
Mr. Pete Etherton

16. JOINT TRANSBOUNDARYTECHNICAL COMMITTEE (continued)

Mr. Craig Farrington
Mr. Richard Yanusz

Enhancement Sub-Committee

Mr. Ron Josephson (Co-Chair)
Mr. Eric Prestegard
Mr. David Barto
Mr. Steve Reifenstuhl

t.b.a. (Co-Chair)
Mr. Pat Milligan
Dr. Kim Hyatt

17. JOINT TECHNICAL COMMITTEE ON DATA SHARING

Dr. Norma Jean Sands (Co-Chair)
Mr. Ron Josephson
Dr. Ken Johnson
Dr. Gary S. Morishima
Mr. Mike Matylewich
Mr. Dick O'Connor

Ms. Susan Bates (Co-Chair)
Ms. Sue Lehmann
Mr. Marc Hamer
Ms. Kathryn Fraser
Ms. Lia Bijsterveld

Working Group on Mark-Recovery Statistics

Dissolved February 2000

Working Group on Data Standards

Dr. Ken Johnson
Mr. Ron Olson
Mr. John Leppink
Mr. William Kinney
Ms. Barbara Haar

Mr. Marc Hamer
Ms. Brenda Adkins
Ms. Susan Bates

Catch Data Exchange Working Group

Dissolved February 2000

18. FRASER RIVER PANEL TECHNICAL COMMITTEE

Mr. Michael Grayum (Co-Chair)
Mr. Hal Michael
Mr. Dave Cantillon

Mr. Al Macdonald (Co-Chair)
Mr. Leroy Hop Wo
Mr. Al Cass
Mr. Neil Schubert
Mr. Mike Staley

19. NATIONAL CORRESPONDENTS

Mr. Charles K. Walters

Mr. Tim Young